OUR COMPETITORS AND MARKETS

ARNOLD W. LAHEE

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OUR COMPETITORS AND MARKETS:

AN INTRODUCTION TO FOREIGN TRADE

BY

ARNOLD W. LAHEE
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To
THE MEMORY OF
MY MOTHER
AND TO
MY FATHER

SEP 19 1961

PREFACE

The purpose of this book is to serve as an introduction to acquaintance with the major foreign countries with which we have commercial relations. To fulfil this purpose, we must go beyond a mere categorical enumeration of the facts of commercial geography, such as size, population, customs, products, etc., and our procedure must be the direct reverse of classification or grouping. Each country is a problem in itself. One is of chief interest as a competitor in industry, and we wish to know whether its competition in the world's markets is growing or declining. Another is valuable as a source of raw materials. A third is a market for our manufactures. Our trade relations with a fourth are disturbed by possibilities of political controversy; and so on. The facts of geography must find their place in relation to our particular interest in the country under consideration. The book is a commercial geography reduced to perspective.

The chief objection to this method of procedure is the great burden of responsibility placed upon the author in the selection of the most important points. This burden has, perhaps, been increased by his endeavor, while approaching each country with a mind open and unprejudiced, not to turn from a subject without having reached a definite opinion. To leave a question unsettled or to remain neutral is an invitation to slipshod or incomplete reasoning, a risk far more serious than that of arriving at a faulty conclusion after having presented definite arguments.

Probably no one will agree with all the conclusions reached — but so much the better! When the book is used as a college textbook, each point of controversy may be made the subject for a class debate or thesis work. The Synopsis of Contents may be of assistance in the selection of subjects. The evidence in the text of the book may be supplemented or brought up to date by individual research. To learn the data of commercial geography, the student should use the index, supplying the figures from the text, and drawing appropriate maps. The study of countries not included here may be facilitated by reference to the "Sources of Information." For the business man, it is hoped that the method of approach and the inclusion of the several countries in a single volume may help him to an idea of relative values, possible otherwise only through extensive reading, and to a basis from which he may appraise magazine articles and newspaper items at their true weight as propaganda or as valid information.

Most grateful acknowledgment is due to the Widener Library of Harvard University for its generosity in according to the writer the privilege of using its excellent and very complete equipment. And second only to this is the author's debt to his wife for her valuable assistance.

ARNOLD W. LAHEE

CAMBRIDGE,
September, 1923.

CONTENTS

CHAPTER PAGE

I. INTERESTS OF THE UNITED STATES 3

Definition of our national aims must precede appraisal of foreign countries. Strength and prosperity of the nation, our basic interest, depend largely upon sheer man power. Industry and commerce support a greater population than agriculture, and facilitate more rapid population growth. So long as the United States remains independent for food, promotion of industry and commerce is a national objective. Our statistics thus indicate healthy development of the United States as an industrial nation.

Most of our trade is at present with Europe — industrial development is said to beget trade — and thus Europe's prosperity has been thought essential for our prosperity. But the proportion of our exports to Europe is declining, and our interest in her as a market for our goods is diminishing. We are interested in Europe as a competitor; in extra-European countries, as sources and markets, and as places for capital investment.

II. GREAT BRITAIN 25

Our trade with Great Britain exceeds that with any other country, but is declining. Our real interest is her strength as a competitor. Her rise began with the industrial revolution, which consisted essentially in the removal of checks upon the increasability of the factors of production. Her position can be maintained only by continued elasticity of the factors. Although today her resources are measured by the extent of the British Empire, their availability for British industry depends on the competitive strength of British industry itself. Her Cotton Textile manufacture enjoys exceptional advantages, but these very advantages now tend to hinder elasticity, and

CHAPTER PAGE

competition is forcing her to diverge from capitalistic production. Her Wool Textiles, though unassailable in foreign trade, show the same reversion from capitalism. Her Iron and Steel industry, basis of national power, is handicapped by depleted ore reserves and the general decline of capitalistic or machine production. Her Coal no longer affords an exceptional advantage in industry, new foreign supplies limit her export radius, and the use of petroleum for fuel will alter the shipping situation. Great Britain's competitive strength is on the decline.

III. GERMANY 70

Germany's industrial revolution was made possible by political integration and the establishment of the Empire. Her autocratic government promoted large-scale industry, exercising control through the banks and state enterprises, and assisted the development of foreign trade. The acquisition of Alsace-Lorraine, with the discovery of the basic process of making steel, and her Westphalian coal, gave a new impetus to her steel industry. The by-products of coke production and her potash monopoly have established her supremacy in chemistry. Through one mistake of her helmsman, Germany lost the original factors of her ascendancy, making her now comparable with her industrial neighbors. With her material supply less readily increasable, Germany may have to turn to quality production. But meanwhile she continues to produce cheap goods; and currency inflation has resulted in an ill-balanced home market and depreciated labor supply. Her prospects as a competitor of the United States are slight.

IV. FRANCE 93

Lorraine recovered, can France duplicate Germany's achievement? France, before the War, was decadent. Various reasons for this are offered, but the fundamental cause was her lack of coal. The War has placed France in a new economic situation.

CHAPTER PAGE

Increased productive capacity, iron and coal reserves, may afford opportunity for transition to capitalistic production. Although her Sarre coal is inferior to Westphalian in location, quality, and extent of reserves, and she must continue to import some coke for her blast furnaces, her requirements will be available in a buyer's market. The Sarre deposits are adequate for the balance, especially when supplemented by electrical power. France will concentrate, however, upon her colonial markets, rather than compete with American industry.

V. ARGENTINA 114

The Pampas, ideal for stock raising and agriculture, are only partly developed. Argentina's slow progress at first was because of internal political turmoil and because the United States supplied Europe's food requirements. Drought, locusts, and latifundia still check agricultural population increase, and remoteness of mineral resources hinder industrial progress. Her one-sided development insures an excellent market for manufactures, but for European rather than American goods. Her products for exchange we do not need, except hides and skins and wool. Europe's requirements are greater than our own, and Europe has competitive advantages which reduce our prospects in Argentine trade.

VI. BRAZIL 134

Brazil is the economic supplement of the United States, — (1) *As a source of commodities we need:* Coffee, Rubber, and Cocoa are important and rapidly increasing imports into the United States. Brazil has ample room for expansion, her output being limited only by present lack of competent labor. Numerous other commodities are of interest to the United States, but others may afford trade relations with Europe. (2) *As a market for our manufactures:* Brazil's consuming population, though preponderantly of low standard, is large and habitually extravagant. Her economic development, affording

CHAPTER PAGE

a market for producers' goods, awaits railway extension. Construction, hitherto hindered by difficulties of topography, may be promoted by harnessing her enormous hydro-electric power. "Our share" of Brazil's import trade depends upon our own initiative. Our position is advantageous and conditions are favorable. Brazil offers a brilliant opportunity.

VII. CHILE 184

Chile has always been important for her minerals: at first, for gold; now, for industrial minerals. She has a monopoly of Sodium Nitrates. Her Copper reserves, enormous though of low grade, may again become available through new economies in the extraction of metallic content. Her Iron resources are now commercially accessible via Panama, and also her other base metals. But heavy exports do not imply a proportionate import trade or market for American goods. A large share represents dividend payments, not purchasing power. The present consuming market is restricted. Mining employs few workers, and the bureaucracy supported by government revenues from mining demands luxury goods. Agricultural expansion is hindered by latifundia and competition of superior resources of Argentina and Brazil. Lumbering is insignificant. Manufactures, though apparently considerable, are in reality slight and promise little development in the future. Chile is chiefly attractive as a field for investment. Politically stable and able to protect herself against aggression, but less secure financially, and dependent too entirely upon mining, she is more suitable for the large investor than the small.

VIII. THE WEST INDIES 215

Political instability is the central feature of the countries of "Middle America." Population and trade are greatest where stability is most assured. Cuba's Cane Sugar production has enjoyed phenomenal expansion since her arrangement with the United States, which insured her political stability

CHAPTER PAGE

and permitted the introduction of capitalistic enterprise. Progress may be expected in other lines of agriculture and in iron mining. The reflection of her prosperity is seen in her import trade. The United States is favorably situated, but caution is advisable owing to Cuba's dependence upon a single product. Intervention by the United States has thrown open the virgin resources of Santo Domingo. The application of the latest methods of production promises her speedy development, and the introduction of internal improvements offer a growing market. Improvement of Haiti is problematical. Porto Rico, though benefited by her connection with the United States, has been handicapped by overdevelopment in the wrong direction.

IX. CENTRAL AMERICA 242

Central America has the same potential wealth of resource as the West Indies. Coffee is the major export, but the Banana industry is our chief interest — as an example of methods of successful enterprise in the tropics, and possibly a means toward stability. But to duplicate this achievement might arouse conflicts of interest, to be controlled in the first place only by a strong government; and Central America's political instability is inherent in the character of the people. There is no hope for permanent improvement, except by external intervention, a question involving the Monroe Doctrine and responsibilities of the United States.

X. MEXICO 258

Mexico offers the same problem as Central America. She has enormous potential resources, agricultural and mineral, the result of her geographic position and topography, but requiring capitalistic enterprise to develop. Her petroleum is of great importance to the United States: our reserves are being depleted, while our requirements have grown imperative. Mexico is the world's chief source of silver. Her copper may be a valuable supplement to

CHAPTER PAGE

our own resources. Sisal we import in large quantity for binder twine. But Mexico's problem lies in her people: a small white aristocracy, a restless, unpractical mestizo majority, the Indian, a ready tool of the mestizo. Mexico's history has been a struggle of the mestizo to subordinate the white with the aid of the Indian. The only stable government, under Diaz, failing to raise the Indian above the influence of the mestizo, was overthrown, and the present mestizo régime is marked by characteristic anti-white sentiment, expressed as anti-capitalism and anti-foreignism. Can the mestizo correct his hereditary defects and prejudices, and establish a durable democracy?

XI. CHINA 280

China appears an unequalled market for manufactures, but has she a surplus product for exchange? Population presses closely upon means of subsistence, forcing extreme economies in production and consumption. Closer acquaintance with the resources of China reveals not only their great variety, but room for expansion of agriculture and increased production by improved tools and methods, mineral deposits for exploitation and for use in manufacturing (for which also she has the other essential factors). A surplus for export, however, will compete rather than exchange with our goods — except silk, our second major import. China is peculiarly fitted for sericulture, and with scientific methods should vastly excel Japan. Thus China does offer great possibilities, but the weakness of her government and the universal practice of "squeeze" hinder her progress: evils to be cured only by external control. But control by Whom?

XII. JAPAN AND THE EASTERN QUESTION 311

Japan resembles Great Britain. Although she is still an agricultural country, she is dependent, like Great Britain, for her raw materials. This is due, however, not to the greatness of her industrial devel-

CHAPTER PAGE

opment, but to meagerness of her resources. She owes her rise to her autocratic government. To continue her development, she must obtain a source of materials, or ultimately suffer eclipse by China. Japan's policy of territorial acquisition is thus not merely for space to accommodate her population, but for self-preservation — and future supremacy. Thwarted by Western interests and American policy, she must resort to methods of indirection, but her objective is manifest. For the maintenance of her rights, China can expect little from Japan, from her own patriots, or from the protection of Europe. Interference by the United States must sooner or later precipitate us in a war with Japan, waged at our great disadvantage. The alternative, to desert China, is a reversal of our policy and leads ultimately to the "Yellow Peril."

XIII. Malaysia or the East Indies 339

The Philippines, our East Indian possessions, are both economically and strategically important in our Far Eastern relations. Malaysia as a whole is of interest as a source of materials, rather than as a market for our manufactures. Rubber production has ample room for expansion; tin, of which the United States is the greatest consumer, offers opportunity for American enterprise; the coconut is of interest for its oil; and the Philippines enjoy a natural monopoly of manila hemp production. Tobacco, sugar, coffee, and petroleum are of chief interest to Europe. As a field for American enterprise and investment, Malaysia offers excellent opportunities.

XIV. India 360

India is one of the greatest countries of the world in agricultural production (her mineral output is slight), but her production per capita is very low. Famines are frequent. Efforts of the British government to reduce this scourge have accomplished comparatively little, owing to the obstacle of established customs and religious tenets. Our purchases of

CHAPTER PAGE

jute, goatskins, and shellac are irregular; and as a market for our manufactures, the opportunity offered is not in proportion to her population. The adverse relations between India and Great Britain, who supplies most of her imports, promise little advantage to the American exporter.

XV. AUSTRALASIA 378

Australia is of chief importance as a market. The people are in character similar to ourselves, and, being concentrated in the cities, are easily reached. Possibilities for expansion are great, but her development is hindered by socialistic legislation, which tends to discourage farming and over-stimulates industry. Her products, moreover, like Argentina's, are of secondary importance to us. New Zealand, unhampered by labor control, is making great progress in agriculture, but her products are the same as those of Australia.

SOURCES FOR INFORMATION 393

INDEX 415

LIST OF ILLUSTRATIONS

FIG. PAGE

1. Urban and Rural Population Growth in the United States . 6
2. Population Growth of the United States, the United Kingdom, Germany, and France 7
3. Exports of Manufactures from the United States, the United Kingdom, Germany, and France 9
4. Composition of United States Trade 10
5. Distribution of United States Exports by Major Continental Divisions, 1903 to 1914 13
6. Major Countries in United States Trade, Annual Average, 1919/21 14
7. Comparison of the Area of European Countries and the United States 15
8. Major Imports into the United States 22
9. Exports from the United Kingdom to the United States, 1870 to 1920 27
10. Area of the British Isles 42
11. Pig Iron Production of the United States, the United Kingdom, Germany, and France, 1871 to 1920 58
12. Area of Germany 84
13. Coal Production of the United States, the United Kingdom, Germany, and France 98
14. The Nations of South America 115
15. Topography of South America 116
16. Argentina 119
17. Foreign Trade of Argentina, Annual Average, 1909/11 and 1919/21 123
18. Climatic Similarity of Argentina and the United States . . 125
19. Cattle-raising Countries of the World, and United States Imports of Hides and Skins 128
20. Brazil, the Climatic Complement of the United States . . 135
21. Coffee-producing Countries of the World, and United States Coffee Imports 136
22. The United States of Brazil 138
23. Coffee Imports into the United States, 1870 to 1920 . . . 141
24. World Production and United States Imports of Rubber, 1900 to 1921 143
25. Cocoa Imports into the United States, 1873 to 1921 . . . 152
26. Cocoa-producing Countries of the World, and United States Cocoa Imports 153

FIG. PAGE
27. Toscanelli's Map of the World 158
28. Argentina, Uruguay, and Paraguay Super-imposed upon Brazil 159
29. Area of Brazil 167
30. Distribution of Population in South America 169
31. Foreign Trade of Brazil, Annual Average, 1909/11 and 1919/21 175
32. Chile 185
33. Copper-producing Countries of the World, and United States Copper Imports 188
34. Foreign Trade of Chile, Annual Average, 1909/11 and 1919/21 196
35. Agricultural Area of Chile 204
36. Area and Shape of Chile 205
37. Length and Area of Cuba 217
38. Cane Sugar-producing Countries of the World, and United States Sugar Imports 221
39. Cuba's Sugar Production, 1850 to 1921 222
40. Sugar-growing Regions of Cuba 229
41. Foreign Trade of Cuba, Annual Average, 1909/11 and 1919/21 231
42. The Central American States 243
43. Topography of Central America 252
44. Mexico 259
45. Topography of Mexico 260
46. Petroleum-producing Countries of the World, and United States Petroleum Imports 263
47. Foreign Trade of Mexico, Annual Average, 1909/11 and 1919/21 272
48. China 281
49. The Natural Defenses of China 283
50. Distribution of Population in China 286
51. Topography of China 287
52. Area of China 294
53. Foreign Trade of China, Annual Average, 1909/11 and 1919/21 298
54. Silk-Producing Countries of the World, and United States Silk Imports 299
55. Silk Imports into the United States, 1870 to 1920 . . . 301
56. The Japanese Empire, Acquisitions, and Economic Penetration in China and Siberia 312
57. Foreign Trade of Japan, Annual Average, 1909/11 and 1919/21 316
58. Malaysia or the East Indies 340
59. Area and Extent of Malaysia 342
60. Foreign Trade of the Philippines, Average Annual, 1909/11 and 1919/21 345

FIG. PAGE
61. Rubber-producing Countries of the World, and United States Rubber Imports 347
62. Tinplate Consumption of the United States, 1899 to 1920 . 350
63. Tin-producing Countries of the World, and United States Tin Imports 351
64. Area of India 360
65. Cotton-producing Countries of the World, and United States Cotton Imports 361
66. Distribution of Population in India 364
67. Land Holdings in India 367
68. Foreign Trade of India, Average Annual, 1909/11 and 1919/21 369
69. India, Showing British Possessions and Native States . . 374
70. Foreign Trade of Australia, Average Annual, 1909/11 and 1919/21 378
71. Distribution of Population in Australia 380
72. Area of Australia 382
73. Sheep-raising Countries of the World, and United States Imports of Sheepskins 385
74. Similarity of the Climates of Australia and Argentina . . 389
75. Foreign Trade of New Zealand, Annual Average, 1909/11 and 1919/21 392

OUR COMPETITORS AND MARKETS:
AN INTRODUCTION TO FOREIGN TRADE

OUR COMPETITORS AND MARKETS

CHAPTER I

INTERESTS OF THE UNITED STATES

Definition of our national aims must precede appraisal of foreign countries. Strength and prosperity of the nation, our basic interest, depend largely upon sheer man power. Industry and commerce support a greater population than agriculture, and facilitate more rapid population growth. So long as the United States remains independent for food, promotion of industry and commerce is a national objective. Our statistics thus indicate healthy development of the United States as an industrial nation.

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Our Central National Interest

To attempt an appraisal of foreign countries without first defining our own national interests and aspirations would result in a mere catalog of quantitative attributes. Any definition of national aims, however, is sure to arouse dissent in one quarter or another. The United States is a country three million square miles in area, with a correspondingly large variety of climatic conditions and agricultural and mineral resources. Each section has its own particular interests, often in direct conflict with those of others. On one point, however, all sections must be in accord: in desiring the greatest strength and prosperity for the nation as a whole.

Modern inventions — the steamboat, the airplane, the telegraph, and "wireless" — have brought about such intimate relations between nations that perhaps it is not unnatural, when we focus our attention upon this aspect, to conclude that "nationalism" is becoming obsolete and being replaced by "internationalism." That such is the case, however, can no more be true than that the interdependence of people living crowded in the cities makes them any less self-interested than their country cousins. Rather the contrary! Although opportunities for earning a livelihood are more numerous in the city, competition for the job is more intense. Similarly, competition among nations of the world is waxing more and more keen. Thus, with growing interdependence, there are more frequent occasions for dispute. Since there is no international police to maintain order and each state is sovereign unto itself, each must develop its own strength to command respect.

One of the primary elements of a nation's strength, so far as may be compatible with its standard of living, is sheer man-power. In war times, the larger the army that can be put in the field without seriously impairing the productive efficiency of the nation, the better is its chance of victory, and the more speedy, of course, will be its recovery. A weak nation is like a man of small means, who may be able to live comfortably enough until sickness comes. Then the doctor's bill, which would scarcely touch the rich man's pocketbook, may wipe away the poor man's savings of a lifetime and reduce him to economic slavery. In times of peace, also, a large concentrated population is an advantage. Progress is facilitated by the exchange of ideas and by the stimulus of close competition.

Industry and commerce support a denser population than can agriculture. Agriculture requires space for the growing of crops and grazing of cattle. On the other hand, space required by manufacturing is inconsiderable. Commerce needs still less. A man sitting in a little office can engage in a flour transaction amounting to millions of dollars and yielding a profit counted in thousands. Ships to transport the flour, sailing weekly, carry a cargo of say 10,000 tons. This represents a whole year's output of twenty average-size flour mills, or the weekly output of over a thousand such mills. But all these mills together would take up only a fraction of the thirty thousand acres of average wheat lands necessary to raise the crop.

The countries of western Europe are fairly comparable in their standards of living. In France, before the War, where 40% of the persons occupied in gaining a living were farmers, and 27% were employed in industry and 9.5% in commerce, the average population density was about 190 persons per square mile. In Germany only 31% of the people were dependent upon agriculture, 36% on industry, and 11% on commerce. The average population density for the nation was 315 per square mile. The average density in the rural districts was 130 per square mile; in the cities, 4300. Holland is poorly endowed with industrial resources, but she has the advantage of geographic location, at the mouth of the Rhine, the gateway of Europe. She combines agriculture and commerce. Her average population density is 518 per square mile. Belgium, her immediate neighbor, has a location only slightly inferior for commerce, and is fortunate in the possession of coal and iron deposits. She combines industry with commerce and agriculture. Her population density is 666 per square mile. England (proper), like Belgium, combines industry, commerce, and agriculture, and has a density of 700 persons per square mile.

Industry facilitates a more rapid growth of population than is possible in a purely agricultural society. Undeveloped countries, by adopting a protective tariff policy, try

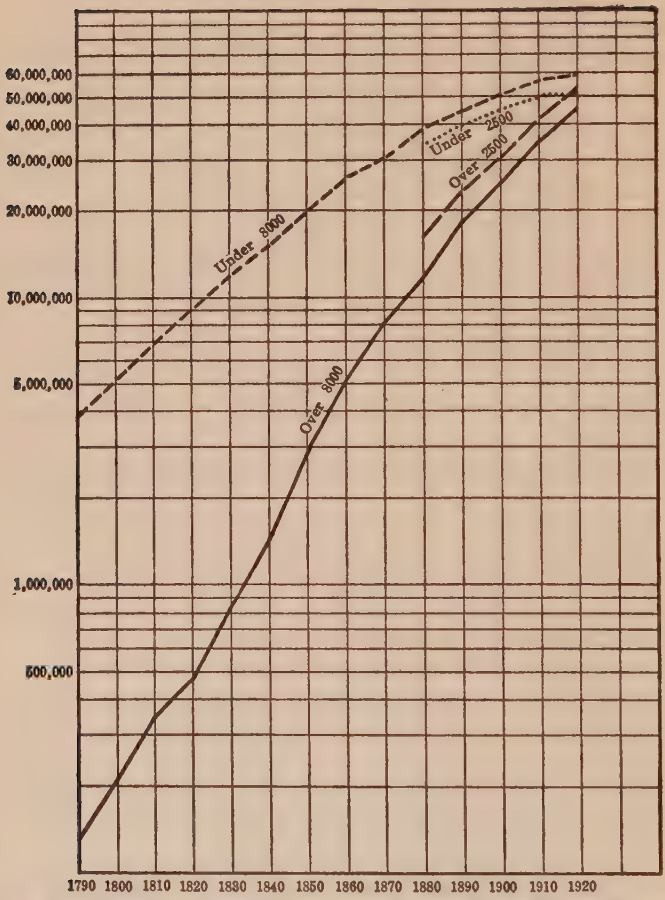

FIG. 1. Urban and Rural Population Growth in the United States.
Urban, places over 8000 inhabitants: solid line
places over 2500 inhabitants: broken line
Rural, places under 8000 inhabitants: dashes
places under 2500 inhabitants: dotted line

to encourage domestic industries and thus become independent of outside sources for their clothing and most essential manufactured articles. This policy has a second and more

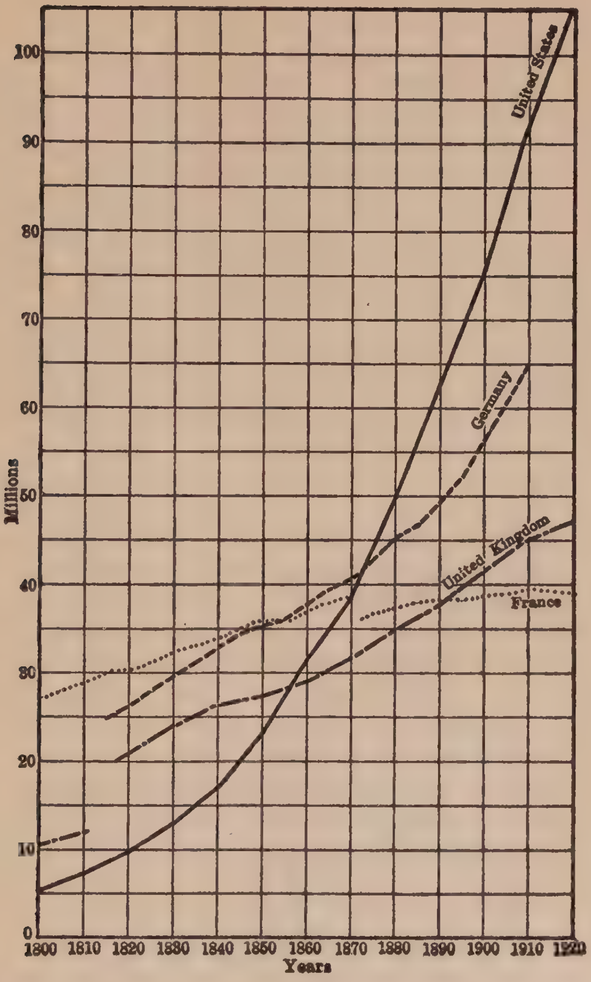

Fig. 2. Population Growth of the United States, the United Kingdom, Germany, and France.

(Prior to 1810 the statistics for the United Kingdom do not include Ireland.)

important effect, that of increasing the rapidity of their population growth. In spite of vast reaches of lands available for agricultural expansion, the urban population of the United States has multiplied at double or treble the rate of the rural population. In an old country, industry postpones stagnation and decay. England, starting in 1800 with a population of less than nine millions, could never have doubled it in fifty years, and almost quadrupled it within the century, on an agricultural basis. Germany's increase from 41 millions in 1871 to 65 millions in 1910 was made possible only by her industrial expansion. In places in China one can find a purely agricultural population as closely settled as 2000 persons per square mile, but this point has been attained only through centuries of slow growth, and at the expense of the standard of living.

The industrial countries of Europe have allowed themselves to be carried too far in their industrial development: to a point at the opposite extreme from that of the undeveloped countries. They depend upon outside sources for their food supplies, a matter far more serious than dependence for such articles as clothing, implements, etc. One can patch old clothes, and can postpone the purchase of a new plow, but one must have food from day to day. Germany's submarine campaign came within an ace of proving disastrous for Great Britain. For the United States, however, any danger of such dependence is remote. Our exports of foodstuffs are 20 to 30% of our total exports and almost double the value of our food imports — 40 to 45% of which consists of sugar from Cuba, with coffee representing about 20% more. We supply 40% of the world's exports of wheat, of corn and oats 25%, and of cotton more than 60%. Moreover, our agricultural output appears to be still increasing at a rate more rapid than the extension of area under cultivation and the number of persons employed in farming. It has not yet reached the point of "diminishing returns."

We may conclude, in short, that the promotion of industry and commerce, although necessarily confined to particular localities and sections of the country, is no mere sectional interest, but a legitimate and fundamental concern of the United States as a nation.

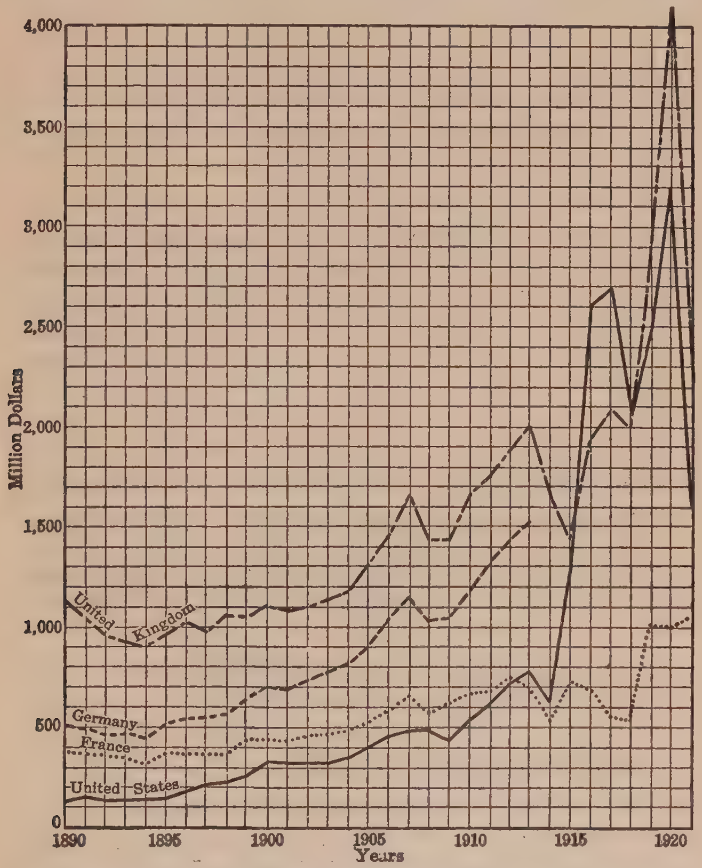

Fig. 3. Exports of Manufactures from the United States, the United Kingdom, Germany, and France.

And actually the United States is becoming an industrial nation. The proportion of our total exports represented by manufactures has steadily increased, from 5.66% in 1820 to almost 40% in 1920. At the same time our dependence upon foreign industrial nations has declined during the century. Our purchases of their manufactures have dropped from 57% of our total imports to 17%. In 1898 for the first time the value of our exports of manufactures exceeded that of our imports. The domestic market was no longer able to absorb the total domestic industrial product or its equivalent of foreign manufactures. Hereafter our industrial growth, proceeding at a rate faster than that of our domestic requirements, will be possible at maximum rapidity only through sales in foreign markets.

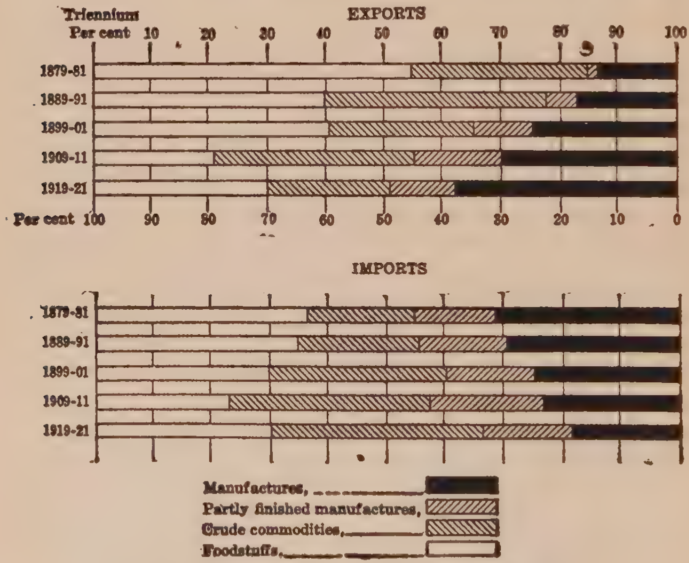

FIG. 4. Composition of United States Trade.

The same period (1820 to 1920) has marked a decline in our exports of foodstuffs and raw materials (until interrupted by the War). Instead of sending our supplies abroad to support industrial populations and so strengthen our competitors, we have been using them to hasten our own development:

Proportion of United States Exports

Triennium	Foods and Materials	Manufactures
1879/81	88%	12%
1889/91	83	16
1899/01	76	23
1909/11	70	29
1919/21	63	37

This trend may be more readily appreciated, perhaps, by the increase of exports of each group, using the triennium 1879/81 as a base of 100. The great increase of both manufactures and partly manufactured materials is most striking:

Comparative Increase of United States Exports

Triennium	Foods	Materials		Manufactures
		Crude	Semi-Manufactured	
1879/81	100	100	100	100
1889/91	75	131	149	133
1899/01	129	140	455	306
1909/11	93	250	880	517
1919/21	468	623	2480	2480

The most significant change in our imports, beside the decline in imports of manufactures, appears in the increase of crude and partly manufactured materials — a further indication of our development as an industrial nation:

Proportion of United States Imports

TRIENNIUM	FOODS	MATERIALS	MANUFACTURES
1879/81	36 %	32 %	30 %
1889/91	34	37	28
1899/01	29	46	24
1909/11	23	53	23
1919/21	30	53	18

Our foreign trade interests, as evidenced by actual statistics, are mainly concerned with the export of manufactures, and with the import of industrial materials and of certain tropical and semi-tropical foodstuffs not raised in appreciable quantities in our own country.

With this definite idea of the fundamental interests of the United States, we are in a position to appraise the various countries with which we have relations. To what extent do their interests conflict with our own, and to what extent do they supplement our own? Can they supply us with materials for our industries? Are they potential markets for our manufactures? Are they competitors, and if so, how strong are they?

Our Economic Interests in Foreign Countries

United States commerce statistics are classified by geographic regions: (*a*) Europe, (*b*) our neighbors in North America, (*c*) South America, (*d*) Asia, (*e*) Oceania, and (*f*) Africa. Our trade with Europe is equal to that with all the rest of the world put together: before the War, 55 to 60% of our total trade, 45% in the triennium of 1919/21. Three to four fifths of this trade consists of exports from the United States. Of our exports, however, about 85% is represented by foodstuffs and materials — foods 25%, crude materials 40%, materials partly manufactured 20% — commodities which, as already shown, we want to retain for our own use.

Nevertheless, the remaining 15%, consisting of manufactures, amounts in value to more than a quarter of our

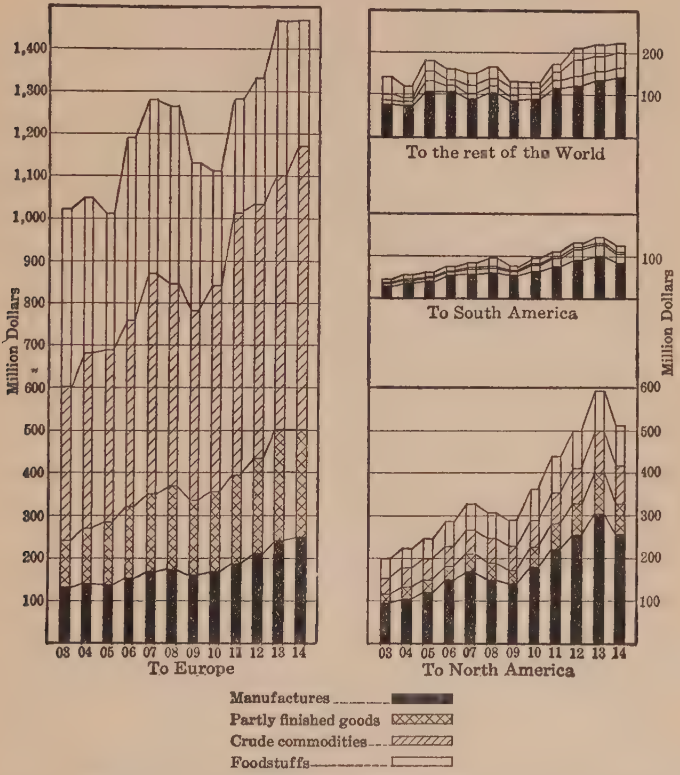

FIG. 5. Distribution of United States Exports by Major Continental Divisions, 1903 to 1914. (Showing composition.)

total exports of this class; more than we export to any other region except North America (chiefly Canada and Cuba), trade which is virtually an extension of domestic business.

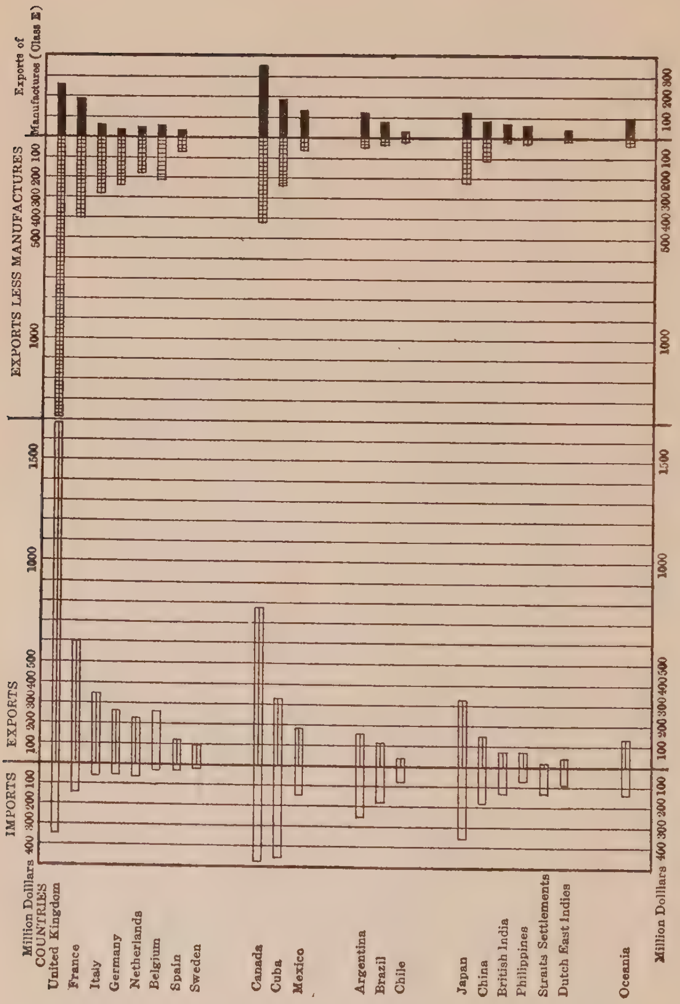

FIG. 6. Major Countries in United States Trade, Annual Average, 1919/21. (Distinguishing exports of manufactures, Class E.)

Our sewing machines, typewriters, boots and shoes, automobiles, motor cycles, etc., appear to find ready sale in European countries beside similar articles of their own manufacture. In 1913 two thirds of our exported typewriters were sold in Europe; 62% of our shoe machinery, 42% of our sewing machines. England was exceeded only by Canada as a market for automobiles. Germany and France each took almost 10% of our agricultural implements; Germany a fifth of our exports of metal-working machinery. So instances could be multiplied.

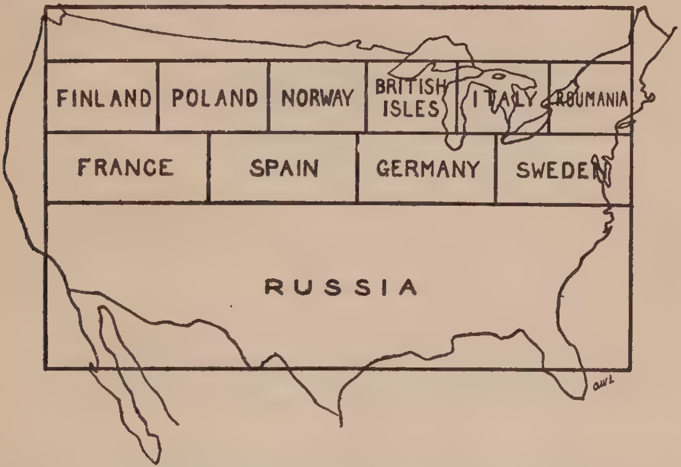

Fig. 7. Comparison of the Area of European Countries and the United States.

It is a favorite assertion of economists, the more attractive perhaps because of its unexpectedness, that industrial development begets trade even between competitors. This is accounted for by the density of population, and consequent breadth of market, and the prosperity of manufacturing districts. The best markets of the great industrial nations of Europe appear to be their neighbors. Belgium's markets, normally, are Germany, France, and Great Britain; France's are Great Britain, Belgium, and Germany; Germany trades especially with Great Britain and Austria-Hungary; Italy, with Germany and Great Britain. Even Great Britain finds France and Germany among her five principal markets.

It would appear from all this that the chief interest of the United States centers in Europe, not only from the point of view of competition, but as a market for manufactures. Moreover, of our imported industrial materials we obtain more from Europe than from any other source. On these grounds it is not surprising that our economists should view with gravest concern the trend of events abroad, and should advocate prompt extension of all assistance possible by the United States — the immediate cancellation of European debts, issue of further loans, etc.; for aside from the fact that the sympathies of almost a third of our population are enlisted through direct kinship (15% were born abroad and the others are of foreign-born parentage), the economic injury to the United States occasioned by chaos in Europe would be serious indeed.

So fundamental and far-reaching are the implications of the theory of the economic importance of Europe to the United States, that the most searching scrutiny of available evidence is advisable.

The trade of European countries among themselves can hardly be accepted as an argument that industrial development begets trade between competitors. Rather, it indicates the importance of the simple factor of propinquity. They are so intimately connected with one another by rail and telegraph, and are comprised within an area so small — no greater, if we exclude the non-industrial countries, than that of the states east of the Mississippi River — that their transactions are more of the nature of domestic than of foreign commerce. They scarcely consider each other as "export markets." The organization of trade differs materially from overseas, what we naturally consider as "foreign," trade.

The numerous instances of American manufactures that find a ready market in Europe, such as sewing machines, shoes, automobiles, etc., do not prove the existence of a permanent basis for exchange. The particular qualities which enable these articles to compete with domestic manufactures are copied sooner or later, patents on new inventions expire, or perhaps the American manufacturer himself builds plants in Europe to produce his article on the spot. The differential advantages thus tend to disappear, while disadvantages of overseas trade remain. The total volume of such commerce will doubtless continue to increase, for no country has a monopoly of inventions; there will always be a constant interchange. But the vast bulk of foreign trade must rest upon more permanent and fundamental differences, such as those of climate or resources.

The statistics of American commerce with Europe presented above, it will be noted, merely show the present situation, not the trend. Our interest, however, is dynamic, not static, less in today than in tomorrow. Upon comparison with preceding years, we find that the proportion of our total exports to Europe has been steadily declining:

Proportion of Total United States Exports Sent to Europe

1880	86.10%
1890	79.74
1900	74.60
1910	65.10
1920	54.27

The trend is distinctly adverse to Europe. This might possibly be due to the decline, already noted, of exports of foodstuffs and materials rather than to manufactures, but for the short period for which we have statistics we find the same decrease, though less regular, in the proportion of our manufactures finding sale in Europe:

Proportion of United States Exports of Manufactures Sent to Europe

1895	43.47 %	43.47 %
1900	43.97	41.35
1901	42.80	
1902	40.77	
1903	39.76	
1904	39.43	
1905	33.77	37.73
1906	32.92	
1907	34.53	
1908	35.44	
1909	36.54	
1910	33.78	31.62
1911	31.10	
1912	30.76	
1913	30.85	

The industrial development of Europe during the last century has brought about a very great increase in population, a broad consuming market. At the height of Great Britain's industrial ascendancy, her population doubled in fifty years. Germany's increased by 63% in forty years. But the rate of increase has not been maintained. Their population growth has been gradually slowing down, may never again attain such rapidity of expansion. In a young, undeveloped country endowed with good resources, on the other hand, population increase may far exceed the highest record attained in Europe. The United States, starting the 19th century an undeveloped country with 5.3 million inhabitants, doubled her population in thirteen or fourteen years, more than quadrupled it in fifty years, multiplied it 14½ times in the century, and twenty times, or 2000 per cent, in 120 years. Brazil today has almost 25 million inhabitants, or over half the population of Great Britain. If Brazil should be able to duplicate the achievement of the United States, she would equal Great Britain in less than fifteen years — not a long period to plan ahead in the export business. Her per capita imports from the United States are low, but the desires of man for material comforts, the requirements of profitable productive enterprise for equipment, are easily expansible. It is within the bounds of possibility that Brazil's requirements of American manufactures (now only $2.50 per capita) might reach the level of Argentina's, $13.20 per capita. We should then be selling her manufactures more than double the value of our exports of this class to Great Britain! Of course this is mere hypothesis, pure speculation, but it is sufficient for our purpose to suggest that the mere fact that the industrial countries of Europe are today our best markets for manufactures is no proof that they will so remain.

More important than the number of people is their purchasing power, the goods or services they can offer in exchange for the commodities they would import. Merchandise shipments from Europe in payment for her purchases from the United States have for many years fallen short of the value of the goods received. The difference has been made up by "invisible" items, services in the form of shipping and banking facilities, and of loans of capital.

So long as the United States was primarily an agricultural nation and did not compete with Europe in industrial markets, it was perfectly appropriate that we should accept the services of transportation and banking. The trade of each was complementary and there was a gain for both in economies from the use of the same intermediaries. As the United States becomes a competitor of Europe, however, trade ceases to be complementary and many of the economies disappear. Moreover, for a country to place itself at the mercy of its competitors would be absurd. Germany at first utilized the services of British banks and ships, but her foreign commerce developed only when she had established her own banks abroad and built her own merchant marine.

As for merchandise, what can Europe send us? The proportion of our total imports in form of manufactures is declining (see page 12); and of those imports, we have been buying less from Europe:

United States Imports of Manufactures from Europe

	Ratio to Total United States Imports of Manufactures		Ratio to Total United States Imports from Europe	
1903	85.2	83.4	40.0	40.0
1904	84.4		42.8	
1905	82.3		38.3	
1906	82.8		40.0	
1907	82.2		40.0	
1908	81.2	81.6	44.0	38.6
1909	82.4		37.7	
1910	82.8		37.7	
1911	81.8		38.5	
1912	79.9		35.1	
1913	77.8	(77.8)	35.5	(35.5)

Europe has little of raw materials and no food to spare us, even if we needed them. Our imports of materials from Europe do show an increase, but they are largely reëxports, not her own products: cotton from Egypt, wool from Australia, tin and rubber from the East Indies, and so on. Whereas in 1880 perhaps a tenth of what we received as "from Europe" were reëxports, in 1910 they amounted probably to a fifth or a quarter. Half of our imports from Great Britain originate in other countries.

How long this roundabout trade will continue is problematical, but it is doubly injurious to us. Europe obtains the materials she reships to us by exchanging for them manufactured articles; but we pay with our foodstuffs. Thus we strengthen our industrial competitors by supplying them with the food we need for our own industries, and neglect the foreign markets we want for our manufactures.

The effect of the War has been simply to accelerate changes that were already in progress. Unless unforeseen events occur to change the trend, we may expect to see a continuance of the decline in rate of Europe's growth in population and purchasing power. The total value of our trade with Europe may increase as the total volume of world commerce increases, but our primary interest will be concerned with her strength as a competitor rather than as a market for our manufactures or as a source for industrial materials.

Our interest in the other continental divisions of the world, the "extra-European" countries, is a matter of simpler definition. They may all be placed in a single category in contra-distinction to Europe. They are of interest to us (1) as sources of foodstuffs we do not grow ourselves and of materials for our industries, and (2) as markets for the sale of our manufactures.

Propinquity, of course, makes North America our best market. Trade with Canada is practically an extension of domestic trade. It is for this reason that we have omitted Canada from our detailed survey in spite of the fact that we sell more manufactures there than anywhere else in the world. Our southern neighbors are more distinctively "foreign" on account of differences in traditions, customs, laws, and products. They thus belong properly with countries more distantly situated.

Very closely connected with the question of sources and markets is that of foreign investments. In order to insure a steady supply of the materials we want, capital investment is necessary, financial control over the sources of supply, mines, plantations, means of transportation, etc. On the other hand, capital investment generally results in purchases of equipment, etc., from the investing country, the seat of the board of directors. From the general investor's point of view, it is advisable to place his money in countries that afford good markets for American products and offer commodities which the United States requires. Property is

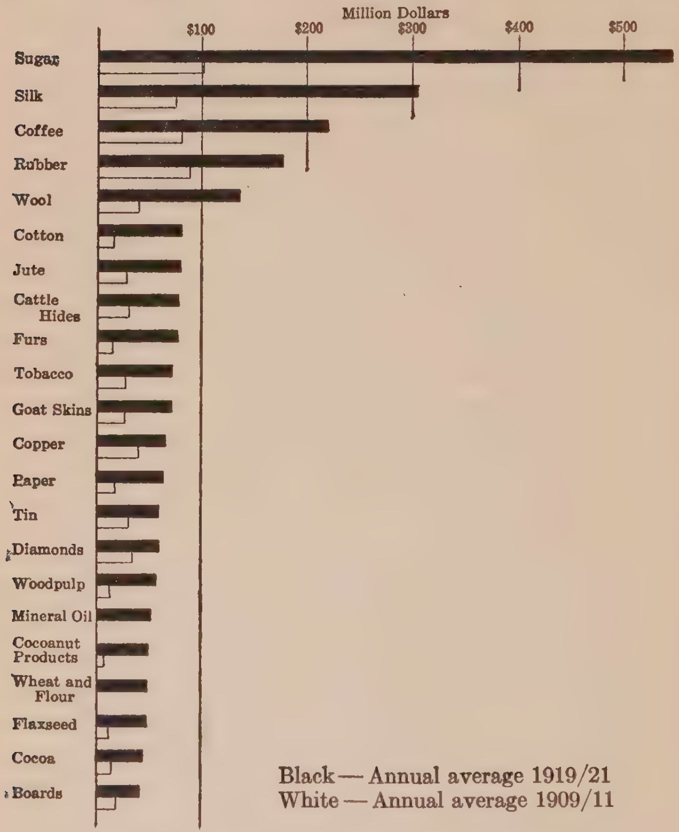

FIG. 8. Major Imports into the United States. (Comprising those over 1% of our total imports, annual average, 1919/21.)

in less danger of confiscation in a country whose economic interests do not compete with our own. Financial operations, moreover, are effected, in ultimate analysis, through commodity transactions.

A would-be investor in a Chilean copper mine, who can find a Chilean importer of American goods anxious to obtain dollar currency with which to pay the American exporter, can readily exchange his money for Chilean pesos, the local currency needed by the copper mine to pay for its labor, etc. The mine, on the other hand, will experience difficulty in paying dividends or ultimately liquidating the loan unless the American investor or some one else in the United States is willing to accept copper. The service of the banks is simply to find the customer in either case. Underlying all the puzzling intricacies of financial operation between nations, these simple principles are fundamental. Of course, there are differences of degree, and other elements must be taken into account, such as political stability, moral integrity, etc., but other things being equal, countries that want American products are suitable so far as making investments is concerned, and countries that produce goods wanted by the United States afford the best prospect of good dividends and profitable liquidation. The investor, being chiefly concerned for the security of his capital and profitable returns, must seek countries that are the best sources of goods wanted by the United States.

From this point of view, although Europe wants American products, she is not a place for American investment under normal conditions, for if her ability to pay for her customary purchases from the United States is becoming doubtful, how can we hope to obtain repayment, or even interest on loans? We should doubtless be willing and glad to repeat the part we played during the War under like circumstances, but we should do it with the full recognition of the fact that, once the loan has been made, Europe has little that we should want to accept with which to liquidate the debt. The only avenue for repayment that would be acceptable to us is one to which European governments would never submit. This is payment by transfer to American ownership of securities representing their investments in foreign countries before the War. For the past century, Europe has placed vast sums in enterprises for the development of the young countries. Railroads have been built, mines opened, banks established, plantations organized with the financial support rendered by Europe. The United States itself has been one of the chief beneficiaries, because one of the most profitable countries for these investments. Before the War millions of dollars worth of American securities were held abroad. These were liquidated to pay for the heavy purchases necessary during that terrific struggle, but there still remains enormous wealth tied up in other countries. That European governments would consider any attempt to use these securities for payment of American loans is doubtful, though the coming years will surely witness the gradual transfer of such securities to American ownership.

But there is no particular need to press for hasty liquidation of the indebtedness. Europe's moral integrity has been proved by past history, her economic and political stability, though badly shaken, will recover in time, and in the meanwhile, the political value of the loans is of very great importance. For the future, however, so far as strictly business motives are concerned, our attention will be turned to other opportunities. Europe's economic strength and financial and political stability will be of interest from the point of view of competition. From the point of view of our own prosperity and strength, we shall be interested in the resources and the market and investment opportunities of the extra-European countries.

CHAPTER II

GREAT BRITAIN

Our trade with Great Britain exceeds that with any other country, but is declining. Our real interest is her strength as a competitor. Her rise began with the industrial revolution, which consisted essentially in the removal of checks upon the increasability of the factors of production. Her position can be maintained only by continued elasticity of the factors. Although today her resources are measured by the extent of the British Empire, their availability for British Industry depends on the competitive strength of British industry itself. Her Cotton Textile manufacture enjoys exceptional advantages, but these very advantages now tend to hinder elasticity, and competition is forcing her to diverge from capitalistic production. Her Wool Textiles, though unassailable in foreign trade, show the same reversion from capitalism. Her Iron and Steel industry, basis of national power, is handicapped by depleted ore reserves and the general decline of capitalistic or machine production. Her Coal no longer affords an exceptional advantage in industry, new foreign supplies limit her export radius, and the use of petroleum for fuel will alter the shipping situation. Great Britain's competitive strength is on the decline.

Importance of Great Britain to the United States

Great Britain stands first among the countries with which the United States has commercial relations. Forty per cent of our trade with Europe and twenty-four per cent of our total foreign commerce is with her. Our trade with Canada, next in importance, is only three fifths as great. Nevertheless, Great Britain's importance to us has been steadily declining:

Ratio of Our British Trade to Our Total Trade and to Our Trade with Europe

	Exports		Imports	
	Per Cent of Total Exports	Per Cent of Exports to Europe	Per Cent of Total Imports	Per Cent of Imports from Europe
1879/81	53%	62%	28%	53%
1889/91	51	65	24	43
1899/01	41	54	18	34
1909/11	29	45	17	33
1919/21	25	42	9	39

Great Britain's imports from the United States consist chiefly of foodstuffs, especially grain and meats, and raw materials: cotton (40% of her total imports from the United States), copper, petroleum, tobacco, and lumber. She pays for her purchases mainly by "invisible" exports and roundabout trade. Her merchandise exports amount to less than half to a quarter of her imports of goods, and of these, moreover, only half are domestic products. The proportion of her reëxport trade has been increasing with great rapidity, indicating an increasing inability to pay for her requirements:

Ratio of Reëxports to Total Exports of the United Kingdom to the United States

1869/71	10%
1879/81	19
1889/91	31
1899/01	49
1909/11	50
1919/21	40

About eighty per cent of her domestic exports to the United States consist of manufactures: linen, cotton, iron and steel, and wool manufactures taking precedence.

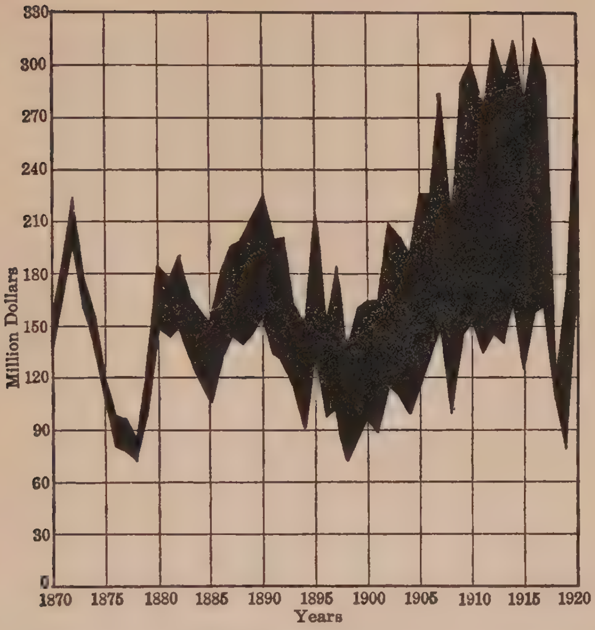

FIG. 9. Exports from the United Kingdom to the United States, 1870 to 1920.
(Showing the increasing proportion of reëxports, the black area.)

The statistics indicate forcibly enough that the importance of our trade with Great Britain, especially with regard to our industrial products, is declining. Our primary interest, as has been pointed out in the preceding chapter, is concerned with her strength as a competitor.

Original Factors of Her Industrial Ascendancy

England's industrial leadership, attained before our grandfathers ~~were~~ born, has come to be accepted as one of the immutable features of this world. Yet history is a continuous story of the rise and fall of power, the prize being passed from one nation to the next as changing circumstances make valuable special qualifications hitherto of little or no importance. Every country has its periods of depression, when the nation seems to be drifting toward anarchy and destruction, but such conditions may be a prelude to greater prosperity than before. We must be careful, therefore, to discriminate between temporary difficulties resulting from the war and the deeper, more significant movements. To this end we shall take time to analyze the original factors of England's industrial ascendancy.

The industrial supremacy of Great Britain, comparatively speaking, is of recent development. For many centuries, owing to her insular position — a serious barrier until recently — she lagged far behind the other nations of Europe in industry, art, and culture. The Normans looked upon the Britons as barbarians. It was only thanks to the religious persecutions on the continent and the repeated influxes of the protestant artisans that industry gained a place in England. Even in Queen Elizabeth's time England was exporting wool to the continent and sending her white cloths there to be dyed and finished. Her real wealth, as late as the middle of the 18th century, lay in her agriculture. Her industrial future was by no means assured, and when her opportunity did arrive, it was due less to her own efforts than to a remarkable conjunction of circumstances, mostly fortuitous, that she attained her greatness.

England had the good fortune to be the first to introduce machinery into "manu-"facture. Before this, and even today in backward countries, artisans working in their own cottages used *tools*, supplying power with their own muscles, guiding operations with their individual skill. By the invention of machinery to do the repeated identical movements, and by the application of natural power which is practically limitless, a far greater quantity of production is made possible and at a much lower cost per unit. Any nation happy enough to be the first to hit upon this, and able to take advantage of it, must inevitably have outdistanced all rivals almost before they could be aware of what was happening.

Invention is popularly supposed to be something in the nature of divine inspiration. As a matter of fact, the production of inventions follows much the same general laws of "supply" and "demand" as the production of potatoes. There is no truer saying than "necessity is the mother of invention."

The birthplace of the industrial revolution was humble. England was among the latest of all countries to introduce cotton manufacture. During the early part of the 18th century, it was inconsiderable beside the woolen and linen industries. The equipment used was still nearly as crude as that in India. The total consumption of raw cotton amounted to between two and three million pounds (1750). Within this modest industry, however, there existed a maladjustment; the weavers could produce cloth faster than the spinners of the neighborhood could supply the yarn, and the market for cloth was sufficient to take all that could be produced. James Hargreaves, an illiterate weaver, made a frame (patented 1770) to carry eight spindles or more, so that while his neighbors were spinning only one thread he could spin a number at once and thus supply himself with his own yarn. James Wyatt in 1739 had invented a machine for spinning by rollers. It was patented thirty years later by Arkwright. In 1774, Crompton combined the principles of Hargreaves's "jenny" and Arkwright's "waterframe" and so produced the "mule." Subsequently, horse-power and soon water-power replaced human muscle.

These inventions were so successful that there began to be an overproduction of yarn. Considerable quantities had to be exported to Germany. There was apprehension that, as soon as the patents expired, "so many spinning mills would be erected and so much cotton spun, that hands never could be found to weave it." This observation led the Rev. Dr. Cartwright to apply his mind to the invention of a power loom. This he succeeded in accomplishing. The balance between weaving and spinning was at last attained. In 1811, 90 million pounds of raw cotton were used: three times the quantity used in 1790 and thirty times the amount in 1750.

It was only a question of time before the new machinery that had proved so profitable in cotton manufacturing was adopted in the other textile trades. But the application of machines could hardly have been very extensive if England had not fortunately possessed iron with which to make them and coal to drive them. The experimental machines were made of wood; Watt's first steam engine was made of tin; but iron is the only material at once plentiful in supply, plastic enough to be made into desired shapes, and sufficiently durable to stand the strain of speed, heat, etc. Water was at first used to drive machinery, but England's water power is irregular and not extensive. Coal, on the other hand, could be readily procured as required.

Prior to the industrial revolution, coal was used almost entirely for household consumption (now only about a fifth is so employed). It was becoming difficult and dangerous to mine on account of the entry of water and constant flooding, and as digging had to proceed deeper below the surface level, the invention of a pump sufficiently powerful to draw off the water became a necessity. Newcomen's "fire engine," as it was called, had been tried, but its extravagant consumption of fuel made it almost impracticable. James Watt was at last successful in improving it, however, so that by 1765 the steam-driven pump became economically feasible. The engine that could drive a pump could drive other machinery. By his one invention, Watt created the power engine that made capitalistic production possible, and made available the fuel to drive it, which would otherwise have remained inaccessible.

From 1700 to 1750 England's iron industry had been practically stationary, declining relatively to the population. Lack of fuel was strangling a formerly important industry. The great oak forests that used to cover the land, famous in song and story as the home of Robin Hood and other bold outlaws, had been cut down for charcoal needed for iron smelting. The invention of coke was without practical results, for coal, as we have remarked, was too inaccessible and consequently too limited in supply. Thus, Watt's engine, by making available the abundant coal reserves suitable for coke for iron smelting, was responsible for the revival of the iron industry, which, in turn, supplied the greatly increased requirements of iron needed for machine manufacture.

The mere possession of resources of coal and iron would probably not have been sufficient to give England her industrial leadership without their happy juxtaposition. Indeed, not forty years ago experts were saying that the distance between ore and fuel in the United States would effectually prevent our ever competing with British manufactures. If such importance was attached to the element of distance so recently, it seems likely that under conditions of a century and a half ago it would have been an insurmountable obstacle.

The introduction of labor-saving devices, of course, met with violent opposition on the part of the old style workers. Then, as always, industrial improvements, while increasing the welfare and prosperity of the people as a whole and in the long run, resulted immediately in the depreciation of the worker's value. His skill, acquired perhaps by years of patient labor, suddenly became unsalable. He was forced to seek employment on a level with children or to change to some other occupation in which he had little training. He was brought face to face with starvation, for he could not wait for conditions to recover their equilibrium, but must have his bread from day to day. Although these difficulties might, perhaps, have been mitigated somewhat (though not completely removed) by insurance against unemployment had they been foreseen, we cannot but sympathize with the worker, then as now. From the point of view of material progress, however, we must appreciate England's good fortune that the cotton industry was relatively new and the workers not organized. It is doubtful whether progress would have been so rapid, or perhaps possible in an older industry, say woolen manufacture, which was thoroughly under gild control. As it was, advance was irregular and left a trail of blood and fire. Hargreaves's machine was broken to pieces by a mob and he was forced for very safety to move to another town. Some machines had to be perfected in secret, and it was only after they had proved their value in the minor industry that they were forced upon other lines of manufacture. Gild opposition was one of the chief reasons for the slow adoption of capitalistic production on the continent.

The hardship upon labor was further aggravated by the necessity under machine production of concentrating industry about sources of motor power supply — at first, by waterfalls, later near coal mines. Previously the cottager had been able to supplement his industry by raising his own food. This was not possible where the population had to live in crowded centers. Reluctance on the part of the cottager to leave his garden and seek industrial employment in cities, however, was overcome by another series of events; and thus what might have been one more obstacle to the introduction of capitalism was removed.

During the 18th century, England still retained the ancient system of "common lands," upon which the small peasant farmer was granted the right to raise his grain, pasture a cow, and gather firewood. Progress in agriculture under such a system was impossible. The enterprising farmer who wanted to apply proper rotation of crops or improve his plot in any way was prevented by the fact that next year he might be assigned a different piece of land, and so his efforts and foresight go for nothing or benefit some one else. As population increased and the uncultivated land diminished in quantity, there was less pasturage for cattle and consequently less fertilizer. A great deal of time, moreover, was wasted in traveling to and from the fields. As the common lands were generally apportioned in parcels in order to give each man a fair share of the best, more time was spent in going from plot to plot. Endless disputes arose over dividing lines and thefts. Indeed, so inferior were the results of farming under this system that it was only a question of time anyhow when it would have been abolished.

Now during the early part of the century great enthusiasm had developed among the landed gentry, stimulated by the writings of Arthur Young, for the improvement of agricultural methods. The importance of leguminous crops had just been discovered; that cattle could be wintered and fed on hay; that stock could be improved by in-breeding; that swamps could be turned into rich fields by proper drainage, and so on. Obviously such improvements could not be introduced by the commoners. The gentry, therefore, lost little time in establishing control over the common lands, by resorting to an old forgotten statute of 1235, whereby landowners were permitted by law to appropriate portions of "waste" land over which free tenants had certain right of pasturage. The ignorant cottagers, of course, were easily taken at a disadvantage. Dispossessed of their meager means of subsistence, they soon constituted a large floating population that was readily drawn upon by the manufacturing centers for the new machine processes. Thus at once was gild opposition met successfully and the necessary concentration of industry effected.

A serious consideration in the introduction of expensive large-scale equipment, as every manufacturer, farmer, and business man can affirm, is the ready capital with which to start. What is true for the individual is also true in a broad sense. While nations on the continent of Europe were being torn by wars and ravaged by invading armies, Great Britain lay snugly behind her shelter of green water. Her industries and agriculture were able to retain the rewards of effort; buildings and equipment and stocks in trade remained untouched. Her contributions of men and money were small in comparison with what she was spared in positive destruction of capital wealth, replacement of which is so slow and laborious. The later wars, which came after the industrial revolution was well under way, were a temporary check to her prosperity, but acted as a spur to greater activity. In 1775 England lost her "sole market" in the American colonies. Out of the American Revolution came the French Revolution and the Napoleonic wars. But still England kept her capital equipment intact. To allow this to lie idle would have been more ruinous than to work for a diminished gain or shrunken profits. The stimulus to greater economy of production, to invention, etc., was simply made more keen.

It was not enough, however, that peaceful conditions should assure to people the retention of their profits. Capitalistic production on any appreciable scale is not possible without mobility of capital. Frequently the man of enterprise is himself without funds. He must be able to reach the man who has a surplus to lend. At first the inventor had to seek out some individual to act as a patron or partner. Today banks are the means for mobilizing money scattered in the hands of many persons and collecting it for use by those who are able to apply it.

The Bank of England was established in 1694 (patterned after the Bank of Venice), with the object of making it easier for the king to borrow money. The practice of loans from goldsmiths was rather unsatisfactory on both sides. Exorbitant interest was charged on the one hand, and the king had an unhappy way of occasionally refusing to pay. As is so often the case, the real value of the bank, the assistance and encouragement it gave for the accumulation and productive use of capital, lay quite outside of the immediate reason for its institution. The development of banking just about this time, therefore, served as another essential factor in bringing about the industrial revolution.

Finally, markets, readily expansible to absorb the increasing output, were essential. A laggard in colonial development, as in other lines, Great Britain did not emerge as a colonial power until about the beginning of the 18th century. She had let other nations pioneer while she was content to imitate. Spain and France had explored the Americas, Portugal and the Dutch were in the Far East, and later, the Dutch reached Australia and Africa. The tremendous booty of gold and silver brought back from the newly discovered lands, however, at length stirred British ambitions. Through her continental wars, she acquired India and the North American colonies — not El Dorado of fable, but one in disguise: expanding markets for her manufactures.

The fact that these were overseas markets was in itself at that time a very important point. Had they been territories accessible only by land, the excessive cost of carriage would have been prohibitive. The roads, according to writers of the time, were "execrable." Conveyance was arduous and expensive. The stagecoach between London and Edinburgh, for example, could make only twelve trips a year, taking two weeks each way. Most of the carrying, indeed, was done by coasting vessels. Roadway on the ocean is furnished free, the only cost being in the ship. We speak of ships, the vehicle, for ocean travel, but of the *railroad,* the way, for land travel, where, compared to the cost of the way, that of the vehicle is inconsiderable. The country that could reach its markets over the sea had vastly cheaper access than the country that must cross the land.

England had the good fortune, not only to be an island, but to possess a coast line very deeply indented, affording numerous excellent harbors for her shipping and greatly reducing the expensive land haul. No point in Great Britain south of the wild moors of northern Scotland is more than seventy-five miles from at least one of her twenty-four major ports (those handling one per cent or more of the total shipping that enters and clears British ports). She has one to serve every 5000 square miles of her area; the United States, with only fifteen major ports (on the same basis as above), has one for every 200,000 square miles.

As the industrial revolution progressed, means of internal communication became increasingly necessary. Again England was very fortunate. The absence of any serious mountain barriers made the building of roads, canals, and railroads comparatively simple. The Pennine range, or "backbone of England," which extends from the Cheviot Hills and south uplands of Scotland to the Cheshire Gap, is broken in two places, by the Aire Gap and by the Tyne Gap, affording easy access east and west. The Cheshire Gap itself is a broad valley separating the Pennines from the Welsh mountains. Through it passes the trade between London and Liverpool via Birmingham, the Pittsburgh of Great Britain.

Road building quintupled during the latter half of the 18th century, to judge by the number of "road acts" passed, and increased as much again in the thirty years following. The first canal built by Brindley in 1761 to transport coal to Manchester gave an impetus to canal building that reached its height during the years 1791 to 1810. A canal from Liverpool to Leeds through the Aire Gap brought the wool manufacturing centers into water connection with the western port, and the Rochdale canal, Manchester to Humber, gave the cotton textile center a port on the side nearest its continental markets.

Railways with wooden tracks, and later with iron straps mounted on timbers, had been used in mines from the 15th or 16th century, traction being by horse or mule. In 1802, Watt's steam engine, which had already been applied to road locomotion (the first automobile!), was successfully used for traction on rails, the shippers, by the way, furnishing their own cars. In 1821 the first railway authorized to carry passengers was built from Stockton to Darlington, and in 1830, the Manchester to Liverpool railway was built as a passenger line.

This brief survey of the various factors that led to England's industrial ascendancy reveals certain points that will be of use to us in judging the prospects of her future development and of competition which the United States will meet from other countries as well. In the first place, we must remark that Great Britain achieved her supremacy, not by the monopoly of any one particular element, upon which she may rest assured of permanent superiority in centuries to come, but by the coincidence of a number of factors possessed quite generally by other countries of the world. Originality of thought or inventive genius is not peculiar to any particular nation — patriotic pride of each nation to the contrary — but finds birth in the circumstances of time and place. Other countries have coal and iron reserves far greater than those of the United Kingdom. The labor market today is more mobile than a hundred years ago, and capital for investment is fluid and knows no national boundaries.

While the possibility may exist of a repetition of England's achievement by other countries, to conclude that all countries have it in their power to become strong industrial nations would be to err as dangerously in the opposite direction. What test, then, can we employ to judge the prospects of industrial development of nations?

The Test of Potential Industrial Development

Among the variety of causes which contributed to bring about the industrial revolution, one point seems common to all: the removal of checks upon the *increasability* of the factors of production. The significance of this point can be readily explained. An article of manufacture is in some respects like a product of cookery. Various ingredients are required in fairly definite, though not rigidly prescribed, quantities. To "increase the recipe" it is necessary to increase all ingredients more or less in proportion; an excessive amount of any one must be corrected by an increase in the others. In the manufacture of commodities, similarly, each factor constitutes a demand for the other factors. We have already noted how inventions in spinning machinery, themselves originating from the pressure of weavers for yarn, so increased the output as to compel the invention of the power loom. It is a truism that if all factors of production were as free as air, there would be no limit to the quantity of output. Every expansion of the market would be answered by a proportionate increase of each factor and of the finished articles. It is equally obvious, perhaps, that the moment that the increase of any one or more factors is prevented, additional production can be obtained only at a sacrifice of the rate of increase or of the quality of the final product, a sacrifice great or slight according to the importance or degree of inelasticity of the fixed factor.*

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* This is to be distinguished from the "law of diminishing returns." "Increasing" and "diminishing" returns are purely relative, not absolute terms. The rate of increase of the product is compared with that of some one or two factors — somewhat analogous to a comparison between the rate of a sailboat's progress and that of the current, waves, and wind that impel it. A little analysis will make the distinction clear.

The customary example taken to illustrate the law of diminishing returns is agricultural production: "land" being fixed, increments of labor and capital yield an increasing product — at first at a rate more rapid than the increase of labor and capital, but after a certain point at a diminishing rate. Now the apparent "increasing returns" ob-

Now, the important factors of production, it may be noted, were all relatively fixed or inelastic in supply until the industrial revolution. While England had always possessed her resources of coal and iron, it was only the invention of Watt's steam engine that made them available. The cotton industry was able to obtain indefinite quantities of raw cotton from America, where there was ample room to grow

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served at first is due to a faulty concept of "land," merely as its area. The concept should properly refer to the soil constituents or plant foods. In a virgin field of given area, up to a certain point, there is a surplus of plant food untouched after the maximum requirement of every seed has been amply satisfied. With every additional increment of seed, the surplus is gradually reduced. Until the point where seeds begin to press upon the available subsistence, the quantity of plant food *actually consumed* is being *increased proportionately* with the increase of the seeds (labor and capital). That is, instead of one factor being held fixed, all are increased in proportion, and the maximum production is obtained. The appearance of "increasing returns," is given just as the sailor, looking at the water alone and neglecting the force of the wind, might imagine that his boat was being driven by the current at a rate faster than its own flow.

"Increasing returns" is usually exemplified by industry. The fallacy, however, is much the same. In industry a very small area of land is sufficient — like a pinch of salt in a loaf of bread. An increment of a few square feet is hardly noticeable in comparison with a great increment of labor and capital. Moreover, space, the essential attribute of land for industry, may be increased by building new stories, an item included, perhaps, under "capital" increase. Thus, while "land" *seems* to be fixed in quantity, it may really be increased in due proportion. Industry is also susceptible of a host of minor economies, all of which are equivalent to an actual increase in one or more factors of production. These the economist is apt to overlook. Keep your floor space absolutely fixed, add machines and men without changing organization or processes, and see how soon you reach the point of diminishing returns! Instead of its being more remote in industry than in agriculture, it appears to be more immediate. The truth that the economist has been trying to express is that in industry all important factors are *more readily increasable in necessary proportions* than those in agriculture.

Similarly, the maximum progress attained among the nations of the world is achieved by that nation whose factors of production are most elastic, most readily increasable in response to the demand of the other factors.

it and no competition for the supply. The introduction of machinery driven by power supplied by nature gave a substitute for human muscle that was indefinitely expansible. Human effort is confined to human bodies; these are dependent upon food, space, etc., which act as deterrents upon the increase of labor. Now, so long as the forces of nature can be drawn upon, power is indefinitely increasable.

Human intelligence, the "human element" that cannot be replaced by mechanical contrivance, was made sufficiently elastic in supply for the needs of industrial expansion through the increase in rapidity of population growth, enabled by the separation of industry from agriculture. In a society where industry and agriculture are carried on by the same individual — a Crusoe, obliged to raise his own grain and vegetables, his flax and cotton, and to make his own clothes and his tools — most of the producer's time would be occupied in making the tools, preparing the materials, spinning, and weaving. Only a minor portion of the day would be spent in planting, cultivation, and reaping. During the War many suburban dwellers found that they could raise enough vegetables in their back yards to supply their families for the winter by expenditure of an hour or two before or after office hours. The revolution, as we have seen, separated agricultural from industrial functions, so that instead of, say, twelve men giving ten hours to their industry and two to farming, ten men gave their full time to industry and two men their full time to farming. The exact ratio between the agricultural and industrial populations needed to maintain an equilibrium cannot be determined. A great amount of industrial work in the form of repairs, etc., is still carried on upon the farm. In many countries, as in France, the cottage industry still persists, and in some, as in Belgium before the War, the industrial workers raise much of their own food in their own gardens. It may be said, however, that in the specialized organization of society, a far greater laboring force working full time is needed for the finishing processes than for agriculture. Thus, by the same token, it requires but a slight increase of farm labor to supply food and materials to support and occupy a great additional force of industrial labor. The industrial population is comparatively free to expand.

Improvements in agricultural processes are equivalent to an actual increase of farm labor and thus facilitate the growth of the industrial population. Where formerly such improvements might result in a reapportionment of the cottager's time, now they lead to greater urban concentration. On the other hand, improvements in manufacturing and economies brought about by concentration of population itself, do not similarly check the growth of the industrial population. They simply tend to increase the consumption of manufactured commodities; for while the per capita requirements for food are nearly constant, the desire for articles of manufacture, if fairly inelastic for any single article, is insatiable for manufactures in general, limited only by the ingenuity of man in devising new things. The rapid growth of urban populations, which has aroused such perturbation among economists, is an inherent feature of modern industrialism. Efforts to remedy the situation by improving rural living conditions, while eminently advisable from other points of view, may actually exaggerate the situation.

Finally, markets capable of expansion to absorb the increasing output were essential. Such were afforded in the first instance by the domestic population. As production was able to outdistance population growth, however, foreign markets supplied a field for the surplus.

In short, our review of the factors leading to the industrial revolution has placed in our hands a test with which to judge the potentialities of other countries for industrial development. The confusing multiplicity of elements necessarily remains, and the task of estimating their relative importance is difficult; but at least we now have a simple measure for comparison; namely, the extent to which the factors of production (and markets) can be readily increased.

Present Strength of the British Empire

Great Britain today is a very different Great Britain from the one of a hundred and fifty years ago. The little group of islands off the coast of the continent of Europe has expanded to an Empire extending over a quarter of the earth's inhabited area, 14.25 million square miles, over four times as large as continental United States, and with a population

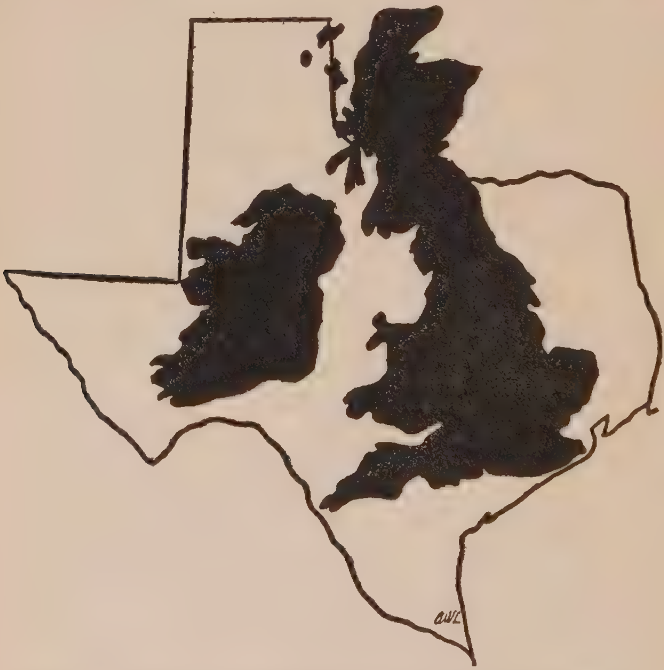

FIG. 10. Area of the British Isles. (Compared with Texas.)

of a quarter of the human race, 445.4 million persons, or more than four times the population of the United States. By far the greater part of this enormous territory is situated in the temperate zone, suitable for habitation by white men. British possessions in the tropical zone, the southern part of India, Borneo and the Malay Peninsula settlements, northern Australia, West, East and Central Africa, parts of the West Indies, and British Guiana and Honduras afford a permanent basis for exchange of products, such as rubber, cane sugar, tea, coffee, fibers, etc., for manufactures.

India, Canada, Australia, and the United Kingdom, together, produce a fifth of the world's wheat crop. The three first furnish 30% of the world's exports of wheat. India and Egypt are second and third in the world's cotton growing, supplying nearly a fifth of the total world production. India, the second largest flax-growing country, with Canada produces 28% of the world's flax. Twenty-five per cent of the world's cattle are in India and three per cent more in the United Kingdom. (The United States has 14%.) A third of the world's sheep are in the British Empire — over 18% in Australia and New Zealand alone.

Mineral resources are not only necessary for victory in war, but equally essential for commercial domination. These treasures of the earth, unlike agricultural products, are fixed in supply. New reserves may be discovered, and old deposits of poor quality may be utilized by new inventions, but such means of increase are irregular and undependable. The British have been aware of this fact, and have exerted themselves to the utmost to extend their political and financial control over the mineral resources of the world. The following table shows the proportion of the world's total output of various minerals produced in the British Empire and the proportion under British financial control.

British Control over the World's Mineral Production *

Mineral	Political Control		Commercial Control	
Iron	3d†	11 %	3d	12 %
Coal	2d†	26	2d	24
Petroleum	4th†	2	2d	9
Copper	2d†	9	2d	13
Zinc	5th†	6	5th	6
Lead	2d†	13	2d	17
Gold	1st	64	1st	63
Silver	3d	23	2d	33
Nickel	1st	85	2d	39
Graphite	2d	22	2d	25
Tin	1st	50	1st	57
Manganese	2d	35	2d	31
Tungsten	2d	34	1st	55
Asbestos	1st	87	1st	64

These facts are, of course, highly important and must be given full weight, but the resources of the British Empire are widely scattered over the world. The capitals of half the area and over three fourths of the subjects of the British Empire are a traveling distance of a month or more from London. Wellington, New Zealand, is six weeks' journey by the shortest route. For the transfer of messages the distance of 12,000 miles has been reduced to an almost negligible amount, thanks to the telegraphic cable and the wireless. Even for mail carriage, the day is close at hand when a relay system of airplanes will run from London to Wellington in a week. Sir Ross Smith and three companions in December, 1919, traversed the distance to Port Darwin, Australia (11,294 miles), in 124 hours actual flying time.

The real problem, however, is not the transmission of messages, but the transport of goods — economic relations.

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* From "Political and Commercial Geology and the World's Mineral Resources," ed. J. E. Spurr.

† United States first.

Here distance and time are of fundamental importance. Canada, contiguous with the United States, has trade interests far more close with us than with the mother country. From Sidney, Australia, to Yokohama, Japan, is 4316 miles; to London, 11,530. From Calcutta, India, to Yokohama is 4537 miles; to London, 7902. Moreover, India, Australia, and Canada are developing their own industries. India, England's best market for cotton textiles, is herself now almost equal in textile manufacture to France and Germany.

To counteract these divergent interests and reëstablish her Imperial system, whereby England may continue as the workshop and the Dominions as the farm, will require competitive superiority of English industry sufficiently marked to induce the colonies to surrender their individual interests and acquiesce in the Imperial policy. She must possess a merchant marine capable of giving service sufficiently frequent, regular, and speedy to underbid carriers of nearer markets. And the successful operation of a merchant marine also depends upon the strength of British industry — upon the quantity of goods to be carried. She must have a navy sufficiently powerful to insure open trade routes. It is as necessary for the British Empire to keep the course of traffic unimpeded between London and Singapore as for us to maintain ours between New York and Chicago. Our lines lie wholly within the periphery of the United States; those between the United Kingdom and the dependencies are exposed on all sides for almost their entire length, thousands of miles in extent. But the strength of the British navy also rests upon British industry. The Dominions are responsible for self-defense in a local sense, but England is mindful of her experience with the American colonies in 1775, and has been very careful to recognize the rights of her colonies with regard to taxation. The general defense is an Imperial responsibility, and must remain so if a centralized and unified policy is to be retained.

If British industries are not in a position to compete with local manufactures or those of near-by producers, the alternatives remain of allowing a dispersion of industry at the sacrifice of the home manufactures, or of using compulsion to force the colonies to subordinate their interests to those of the mother country. In the first case, the unity of the Empire would be gradually weakened and the administrative head would become subordinate to the members. The whole structure would eventually break down. In the second case, the policy would have to be supported by an invincible navy, strong enough to compel reluctant obedience. But again we are brought back to the consideration of the strength of British industry to support the burden of such a military establishment. British industry is the keystone of the arch, the strength of the Empire as a whole.

The Cotton Textile Industry

From the point of view of trade relations, Britain's most important industry is cotton textiles. Twenty to thirty per cent of her total exports consists of cotton manufactures — four fifths of her entire cotton textile production is for foreign markets — and about ten per cent of her imports for domestic consumption is raw cotton. Her industry consumes about a fifth of the total cotton production of the world.

As it has already been noted, the industrial revolution first occurred in the cotton textile industry, which at that time was very insignificant as compared with wool textiles. With machine production, however, England speedily overtook other European producers. The impetus gained over the rest of the world gave her a practical monopoly of the entire foreign field. In addition to this head start, she has certain permanent advantages.

The climate, which is moist and temperate, is peculiarly well suited for cotton manufacture. So far it seems to be unsurpassed. A dry or cold atmosphere makes the cotton fiber too brittle, and artificial humidifiers have not yet succeeded in producing conditions as perfect as those in England. Heated buildings in cold weather seem to make the brittleness worse. In England, the industry has concentrated on the west slope of the Pennine Range. The prevailing winds are southwesterly and come laden with moisture from the sea; the mountain range causes precipitation in frequent showers. Although the latitude is the same as that of Hudson's Bay, almost as far north as Alaska, the Gulf stream, sweeping across the Atlantic from the Gulf of Mexico, makes the climate temperate and equable.

The special climatic advantages of the region and the proximity of coal have led to a concentration of the industry greater than that of any other country. Ninety per cent of the spindles and looms in Great Britain are located in the County of Lancashire, which is only half as large as Rhode Island. Further concentration of particular kinds of production — coarse and medium yarns in and about Oldham, fine yarns near Bolton and Manchester, weaving in the northern and eastern sections of the county, and so on — have brought about distinct advantages in making available a steady supply of workers trained in each particular branch, and the establishment of specialized repair shops and subsidiary industries.

In addition to these advantages, no other country has yet organized its export trade so efficiently or so broadly as have the British. The greatest competition that American manufacturers will experience will doubtless be due chiefly to England's excellence in marketing.

But Great Britain is beginning to suffer from her advantages! She has enjoyed so many years of easy prosperity that the manufacturer has come to take it for granted. Machinery that was good enough to earn millions for his father and grandfather is good enough for him. The incentive for improvement has been slight, for conditions many years together have been relatively stable. For fifteen years from 1888, when exports of cotton piece goods reached five billion yards, they remained at about that figure, though increase was more rapid after 1904, and exports reached seven billion yards in 1913. The need for new machinery has arisen so imperceptibly that it has been difficult to decide upon a definite reorganization. In the United States, on the other hand, changes in the market have been so very rapid that we have outgrown our machinery while it was still new. Changes in organization and technique have compelled constant improvement. An indication of the relative position in the two countries is found in the application of power. In England the worker's manual labor is reënforced by power to only 65% the extent it is in the United States. There are 15,000 automatic looms in Great Britain as compared with 400,000 here. The productive efficiency per wage earner per annum is 71% that of the American worker.

Labor in Great Britain has been born and brought up in the cotton district. The fathers of the operatives, their grandfathers, and great-grandfathers were cotton mill operatives before them — in contrast to the United States, where we have had to content ourselves with immigrant labor, entirely unskilled, who have probably never before seen a factory machine. In Great Britain, naturally, the employees have become very strongly unionized. In direct contrast with conditions in the industry at the time of the industrial revolution, they are quite able to prevent effectually the introduction of labor-saving devices. The automatic or warp stop loom widely used in the United States is comparatively rare in England. It costs about two and a half times as much as the ordinary loom, but while only four plain looms can be attended by one man, a weaver can tend eight or twelve of the automatics. The ring spindle produces twice as much yarn as the older type "mule" spindle. In the United States 90% of the spindles are ring spindles; in Great Britain only 20 to 25%.

A related evil is the positive reduction of output by "soldiering." The American weaver tends twice as many looms as the English weaver on the same type of machine. The American ring spinner is in charge of 750 to 1000 spindles, the English girl, from four to eight hundred, and the speed of her machine is slower.

Thus in spite of her advantages, England is in danger of losing her position of world supremacy in cotton textile production. Already Japan is well on the road to acquiring the Far Eastern markets for coarse goods. In 1877 Japan first began to experiment in cotton spinning; by 1890 she had about 280,000 spindles; ten years later, 1,330,000, and in 1920 some 4,000,000, and almost all of them ring spindles. In 1900 she was exporting yarn and textiles to the value of 23 million yen. She had increased this to 65 millions in 1910, and to 488 millions in 1920. Her total mill consumption of raw cotton was over two thirds that of Great Britain herself. India's own textile manufacture has also been increasing. Her mill consumption of cotton in 1920 was about half that of Great Britain.

Lancashire has felt this competition. In 1890, 40% of British exports of cotton piece goods were consigned to India, now only 30%; instead of 11% to China, only 8%. The War hastened the contraction of the Eastern market, so that in 1920, 43.6% of the British exports went thither instead of 56.4% as in 1910.

Although the market for American textile manufactures is chiefly at home, the United States has actually displaced Great Britain as the foremost cotton manufacturing country of the world. The number of spindles is generally taken as an index of production. Before the War, the United Kingdom had 38% of the spindles in the world, 75% more than the United States and five times as many as Germany. But this comparison is faulty, owing to the failure to distinguish between ring spindles and mule spindles. Moreover, American manufacturers operate at a higher rate of speed, 10,000 revolutions per minute as compared with 9000 in England. We are not altogether surprised to learn, therefore, that British mill consumption of raw cotton before the War was only about two billion pounds to our two and a half. In the year ending July, 1920, British consumption was half that of United States mills. In quantity of piece goods manufactured, the United States in 1910/13 stood 21% higher than Great Britain, and in total value of cotton goods (in 1907 and 1909), about 25%.

Our export trade before the War was less than a tenth that of the United Kingdom, and only about a fifth to a quarter in 1920, at the height of our prosperity when England was just recovering from the War. France and Italy each produced (1910/13) a fifth as much as the United States, but are close competitors in foreign markets. The American industry, however, has been growing by leaps and bounds, almost fifty per cent increase in output per decade since 1880. The domestic consumption per capita has almost doubled in this time. Now the United States uses twenty-five to thirty pounds per capita, over double the consumption of any other country and five times as much as the average consumption of most countries. This wide difference suggests at once an approach to the limit of per capita consumption in the United States. If our industry is to continue to expand, it must turn to foreign markets.

It has been argued that the backwardness of the British industry is more apparent than real, that it is merely an adjustment to different economic conditions. It is explained that the British product is of finer grade than ours. The mule spindle is better adapted for spinning the finest yarns, and less raw cotton is required. England's climate and her highly skilled labor supply give her an exceptional advantage in this line of goods. Thus what may be best in the United States or Japan may be ill suited to her own conditions.

A glance at the export statistics, however, reveals that half to two thirds of England's piece goods go to Asia and Turkey, poverty-stricken countries that can afford to buy only the cheapest goods, valued in the trade statistics at an average price of a third to a quarter as much per yard as those sent to European customers.

But even if the assertion were true, it tends to distract the attention from the essential point. This is that the United States *can* use machinery and unskilled labor. Skilled labor is inelastic in supply; expansion is hampered by human capabilities. Unskilled labor operating machines driven by natural power can be increased indefinitely, as the industrial revolution showed. The very possibility of using unskilled labor removes another effective check upon expansion, the opposition of unions to the introduction of improvements. The strength of the union is more difficult to maintain, when a lot of new operatives can be brought in from the farms or from foreign lands to take the place of union labor.

Great Britain's dependence upon foreign sources for her raw materials did not affect her adversely, while she was almost the only large market in the world — except during the Civil War. Today increasing competition of other manufacturing countries tends to restrict the quantities available for British industry, to say nothing of the danger from dependence upon the political policies of a country over which England has no control, in whose government she has no voice.

The severity of competition in medium and coarse lines, and the tendency toward restriction of raw materials, are forcing Great Britain to capitalize her peculiar advantages of climate and skilled labor supply, and to concentrate more and more upon fine-quality goods. The market for such goods, however, is far narrower than the market for cheaper grades — perhaps becoming more restricted as principles of democracy gradually spread over the world and the upper class avoids making itself conspicuous above the tastes of the middle class.

If we apply the test of industrial progress, which we found revealed by England's own industrial revolution, we must conclude that her cotton textile industry, upon whose prosperity so much of her industrial strength and the strength of the Empire itself depends, is facing a decline.

The Wool Textile Industry

In contrast with our interest in Great Britain's cotton industry, our concern in her wool textiles is confined entirely to their bearing upon the general prosperity of the nation and the Empire. The United States has practically no export trade of wool fabrics and seems little likely to, although the industry, under the protection of a high tariff, has grown to keep pace with population growth, until it has reached a volume of production equal to that of the British industry.

The United Kingdom was never able to obtain so great a leadership among the nations of the world in wool manufacturing as in cotton textiles. This was chiefly on account of the world-wide distribution of the industry. There was scarcely a nation without sheep on the farms and spinning wheels and looms in the houses. Its widespread nature can be appreciated, perhaps, from the way in which it has "woven" itself into our daily speech: to spin a yarn, to unravel a mystery, a tangled skein, the thread of discourse, a web of sophistry, fine drawn theories, the spinster, and so on.

The importance of the industry to Great Britain is much less than that of her cotton manufactures. Only about half as many workers are employed. Her exports of wool manufactures amount in value to a third of her cotton textile exports, or 8% to 10% of her total exports; and the net purchasing power of these — that is, their value after deducting the cost of the imported wool and yarn used in their manufacture — is only a quarter that of exports of cotton textiles.

Nevertheless, Great Britain's position in the *world trade* of wool tissues has been unassailable. French and German exports before the War were each less than a third those of Great Britain in value. Almost every country in the world is a purchaser of wool fabrics from the United Kingdom. Even the United States imports annually over our 50% tariff about five million dollars worth.

One important feature of Great Britain's export trade, however, seems to have escaped general attention: a steady increase in exports of woolens and an equally marked decline in worsteds:

British Exports of Woolens and Worsteds

Year	Woolens	Worsteds	Source
1870	32 mil. yds.	236 mil. yds.	*
1880			
1890	57 mil. yds.	172 mil. yds.	†
1900	51 mil. yds.	102 mil. yds.	†
1910	95 mil. yds.	95 mil. yds.	‡
1920	140 mil. yds.	62 mil. yds.	‡

Worsteds are fabrics made of yarn in which the wool fibers have been twisted together; woolens are fabrics made of yarn in which the wool fibers have been simply matted together. Wool fiber, unlike cotton and other fibers, is covered with minute scales. These scales tend to intermesh, and are sufficient to hold the strands merely by matting them. This was the original manner in which wool yarn

* Porter: "Progress of the Empire," p. 337.
† Statistical Abstract of United Kingdom.
‡ H. Dawson & Co.: Bul. of Wool Manufactures.

was spun. It was found, however, that by combing out the wool so that the fibers lay parallel, and then twisting them, a much stronger yarn was produced. The only objection was that short fibers could not be combed, while woolens could utilize "anything long enough to have two ends" — and the best wool, "merino," is short.

Nevertheless, worsted manufacture received a stimulus from an unexpected quarter. The growth of industrial populations increased the value of sheep for their meat, and it became good economy to raise them for mutton as well as for their wool. The merino sheep, however, is of lean body and therefore little use as a meat animal. The best mutton animals had long, coarse wool, suitable for combing, and thus for worsted manufacture, though not for high-grade goods.

A further stimulus to worsted manufacture came with the improvement of the wool fiber of meat sheep by crossing with the merino. The finer qualities of worsteds began to be of interest to the higher class purchaser. Also improvements have been effected in the machinery for worsted manufacture by which shorter staple wool can be combed.

Although today worsteds can be purchased of as good quality as woolens, and woolens, especially those made of shoddy, may be cheap, worsted tissues are appropriate to the common man, the middle class, woolens to the upper class. Woolens are soft and less durable; they are particularly suitable for custom production in that they may receive almost any variety of finish after they have been woven. Worsteds are durable but tend to "get shiny." They are turned out on a large scale, all of the same pattern and finish, for after they have been woven they cannot be changed to suit the wishes of the particular customer.

The trend of the world's wool manufacture is in the direction of worsteds. As is natural, therefore, the worsted industry is more highly developed than the older woolen industry, more highly specialized, equipped with larger and more expensive machinery.

Why, then, do we find Great Britain proceeding in a direction contrary to the general trend? Of her actual production, statistics are inconclusive. The decline in her dependence upon Australian wools, which are chiefly merino, from 65% of her imports in 1880 to less than 40% in 1910, might indicate the development of worsted manufacture for her domestic market, her woolens being particularly for foreign consumption. This would be natural since other nations aim especially to protect their worsted industry, and British woolens are highly superior to those of any other country.

Whatever the explanation may be, the fact remains: Great Britain is specializing, as in her cotton industry, upon luxury goods. She is proceeding in the face of the world trend to supply an inherently restricted market; and she is turning away from capitalistic production.

The Iron and Steel Industry

Great Britain's exports of iron and steel manufactures are a close second to her cotton textile exports. If we include cutlery and hardware, implements and tools, machinery and vehicles, with the products that comprise the iron and steel group in the official statistics, the combined value comes to 20% of her total exports of domestic products. The actual purchasing power of her iron and steel exports — obtained by deducting the cost of the imported materials used in manufacture — is double that of cotton textiles.

These figures, however, fail to indicate the real, the vital importance of the industry, for iron is the very foundation of the prosperity and strength of nations. It was the possession of iron that made possible the building of machines, without which the industrial revolution could never have come to pass. Iron is still the basic material of which machines are made. In the United States, the opening of the

Sault Ste. Marie canal, which made it possible to bring cheaply by boat iron ores from the rich Lake Superior region to the coal fields near Pittsburgh, was the starting point of America's ascendancy. The seizure of Alsace-Lorraine, with the enormous iron reserves, marked the beginning of Germany's meteoric career. The question of Japanese control of the iron reserves in China will be one of the serious political problems of the immediate future.

Of all minerals, iron alone at once exists in sufficient quantities, and possesses or can be given the qualities necessary for countless uses in our present civilization. The huge girders for bridges or for "sky-scrapers," the hairspring of your wrist watch with its 432,000 contractions and expansions per day, rails, battleships, delicate surgical instruments — a list well-nigh endless and infinite in variety — are all made of iron. There could be no better index to the economic strength of a nation than its iron industry.

Although Great Britain's iron resources were ample at the time of the industrial revolution to supply all her requirements and permit ready expansion, judged from the point of view of requirements today, they are wholly inadequate. Her high-grade ores are relatively meager in quantity. She has perhaps double the amount of low-grade ores workable because of their accessibility to coal or markets. The remainder, thousands of millions of tons, is unworkable now, and will be exploited only if there should arise some particular reason for manufacturing steel in Great Britain rather than elsewhere — a contingency that seems hardly likely to arise. Of known reserves, she has about 450 million tons; of possible reserves, 10,380 million tons. At her present rate of production, 15 million tons per annum, her known reserves will last only some thirty years.

The discovery of resources in other countries has reduced Great Britain from foremost rank to a very second-rate position. France today has six times as much iron (Fe content). The United States has seven times as much in known reserves and upwards of ninety to a hundred times in potential. Canada, Brazil, China, have reserves thought to be enormous.

In 1875 Great Britain was mining half the iron ore produced in the world; in 1910, her output was little more than a tenth. Already she has become dependent upon outside sources for ores for half her pig-iron production, and is steadily becoming more dependent. The importance of such dependence, especially for a mineral product, and for iron above all others, cannot be exaggerated. Unlike cotton and wool, which may be raised wherever conditions are suitable, minerals can be obtained only where nature has placed them in the beginning. The transportation of ore, of which so large a proportion is waste matter, may become a serious if not prohibitive item of cost.

The gravest indication of Great Britain's present economic position, however, is the complete stagnation of the industry. Since 1881 the production of pig iron has only kept pace with population growth. Compare this with the consumption of iron in the United States, which has increased, per capita, 50% each decade!

England's iron and steel industry appears to be affected by many of the same factors that we have noted in her textile manufactures: over-conservatism of management, opposition of labor to improvements, and positive reduction of output. But deeper than the causes within the industry itself is the general reversion from capitalistic production throughout British industry in general resulting in stagnation of the demand for new machines.

The application of power may be taken as an indication of the use of machinery, capitalistic production. The slight use of power in British industries as compared with American affords evidence of the backwardness of her present industrial development:

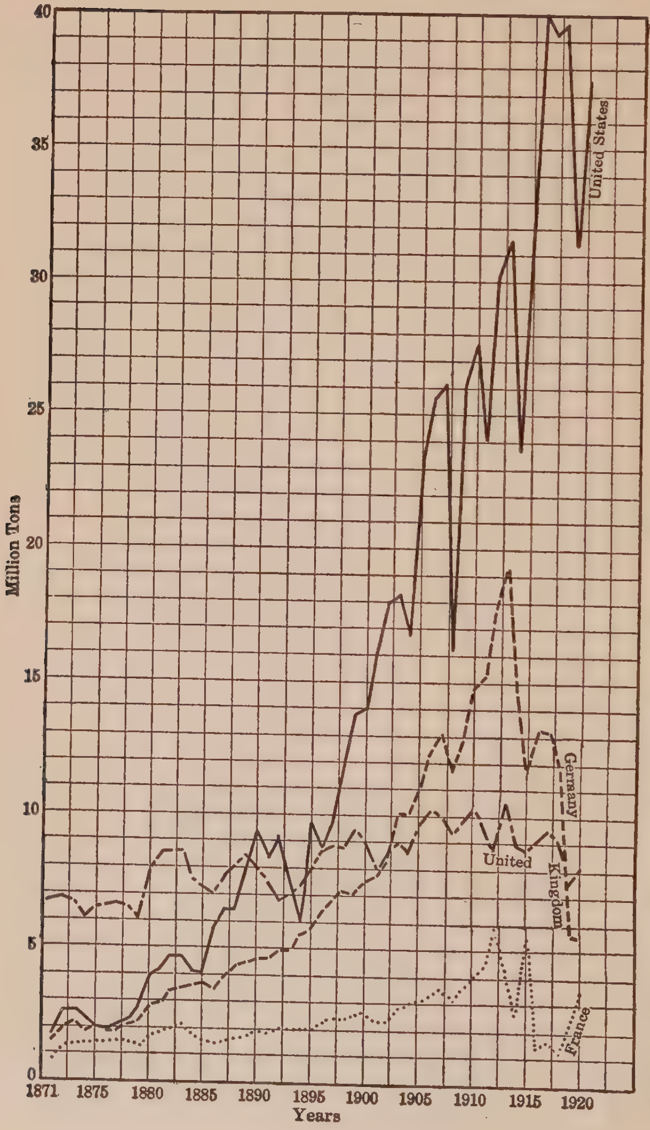

FIG. 11. Pig-Iron Production of the United States, the United Kingdom, Germany, and France, 1871 to 1920.

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*Use of Power in British and American Industries**
(Horse Powers per 1000 Wage Earners)

Industry	United Kingdom, 1909	United States, 1907	Ratio U.K.:U.S.
Boots and shoes	172	486	1: 2.8
Brewing	937	6209	6.6
Butter and cheese	1477	5507	3.7
Cardboard boxes	114	590	5.3
Cement	3195	13873	4.3
Clothing	45	165	3.7
Cocoa, etc.	346	980	2.8
Cotton goods	2214	3433	1.5
Clocks and watches	125	628	5.0
Cutlery and tools	420	2069	4.9
Dyeing, fin'g text	1949	2449	1.3
Firearms and am.	595	1214	2.0
Gasworks	687	3469	5.0
Gloves	113	256	2.3
Hats and caps	181	588	3.2
Hosiery	163	804	5.0
Leather tanning	847	2389	2.8
Lime	701	1991	2.8
Matches	408	1729	4.2
Paints, oils col.	1375	4012	2.9
Paper	4201	15846	3.8
Pens and pencils	241	710	2.9
Printing and publishing	1133	1154	1.0
Railway carriages	1126	2274	2.0
Silk	608	989	1.6
Soap	1092	2160	2.0

In general a country exports those manufactures which it produces primarily for domestic consumption. The high quality of the commodity, which recommends it for other markets, is maintained by standards established through competition in the home market. The quality of materials and construction of American locomotives, built to haul average paying trainloads of 533 tons (and up to 4000 tons), will naturally excel the standards required in Great Britain, for instance, where the average paying trainload is only 134 tons. Similarly the advantages of standardization — interchangeability of parts, accuracy (to the .000025 part of an inch) obtainable by machine work, dependability (for tests for non-standardized machines are never conclusive) — can be gained more easily where large quantities are demanded for domestic consumption. Our output of automobiles reaches 2,000,000 per annum, Great Britain's, 70,000. It is scarcely conceivable that British manufacturers of machinery should be able to maintain a high competitive standard while the domestic demand remains dormant. In the United States, on the other hand, the constant pressure for the improvement of technical methods is bound to promote the general excellence of American machinery, which will soon become recognized the world over. Already, indeed, it is beginning to show in our export trade. In 1880 our exports of iron and steel manufactures amounted to less than 2% of our total exports; now (1920) they reach 18%. Of these, machinery used to be about a quarter, now it is a third. And in contrast with Great Britain, our resources afford room for almost indefinite expansion.

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*Statistics taken from "Economic Statesmanship," by J. Ellis Barker.

In respect to the fundamental basis of national strength, the iron and steel industry, Great Britain shows herself appallingly weak: limited in material resource, bound by unionism and conservatism, serving a stagnant home market, and facing displacement in foreign markets.

The Coal Trade

A fourth major item of export, not an article of manufacture, but a product of the natural resources of the British Isles, is coal. In importance, her coal exports (including bunker coal) are equal in value to her exports of wool manufactures, amounting to 9 or 10% of her total exports. In purchasing power, however, the coal approximates that of cotton textiles, for, as a product of her own natural resources, there is no item of imported materials to offset the nominal export value.

The real importance of coal is far deeper than the mere question of export trade, for it is the fundamental material factor of production. "Coal," writes Prof. C. R. van Hise, "is by far the most important of all mineral products. Next to coal in importance is iron. These two are of much greater consequence than all the other mineral products together." Nations lacking coal and iron are handicapped from the outset for industrial development. From a military point of view, they are practically disarmed and helpless. Who dominates the coal and iron industries of the world dominates the world.

The moral significance of the tragic "crime of Belgium" and the sweeping invasion of France naturally made more impression at the time than the fact that Germany, in the first few weeks of the War, had seized control over practically four fifths of Europe's iron reserves and three quarters of the coal resources. "By acquiring the line of the Meuse and the French coast of the Channel," so ran the joint petition of the six greatest associations of German business men, presented on May 20, 1915, to the Imperial Chancellor, "Germany would obtain . . . the coal districts of the Département du Nord and of the Département Pas de Calais. . . . The possession of vast supplies of coal, and particularly of coal rich in bitumen, such as that which is found in northern France, is at least as decisive for the issue of the War as is the possession of iron ore. . . ."

Coal was a primary factor in bringing about the industrial revolution by supplying the power for driving machinery and fuel for smelting iron in large quantities. About half the coal consumed in the United Kingdom is now used for industrial purposes. Ninety per cent of her total engine capacity depends upon coal as fuel; ninety-five per cent of her electric dynamos are driven by coal engines. Only ten to twenty per cent of her output is used for domestic purposes.

To Great Britain coal is of particular value on account of her lack of water power. Although in places in Wales and Scotland there is a rainfall of a hundred inches per annum, the streams are small and short, necessitating electrical development in small scattered units, a system very uneconomical and hardly capable of generating power on a sufficiently large scale. Her total potential power is estimated (1922) at 900,000 horse power. The present actual development of the Niagara Falls alone, on both sides of the national boundary, is a million horse power (the total capacity of the Falls, six million), and New York state has developed 1.3 million h.p. Great Britain's actual water-power development, about 200,000 h.p., compares with New Hampshire, 217,000 h.p.

In her foreign trade coal has been of great advantage. The United Kingdom imports heavily of bulk goods — raw materials and grains — but exports chiefly manufactured commodities of high value but relatively small bulk. With her coal, she has thus been able to fill the waste space of her outgoing ships. The significance of this in relation to trade competition in foreign markets is obvious, for with well-balanced shipping between herself and her customer, each cubic foot of cargo space earning its full value in both directions, England could afford to charge lower freight rates than a competitor with a similar trade balance but without coal to export.

The proximity of high-grade coal to the sea, near Newcastle and Cardiff, has been a further asset. In shipping it is necessary to economize cargo space to the utmost. Steamers must use coal of high carbon content. Such coal no other country has in large quantity immediately adjacent to the coast. Great Britain not only supplies her own outgoing ships, but exports quantities to coaling stations in distant parts of the world, such as Singapore, Shanghai, Sydney, Valparaiso, Cape Town, Halifax, and others. Her merchant and war ships thus have an unrestricted supply of fuel with which to replenish their bunkers and continue their voyages without vexatious delays. Cheap fuel is also an attraction for foreign vessels to make a British port one of their stopping points, and, naturally enough, a trading place for part of their cargo.

This advantage was a decided factor in bringing about the great development of the British merchant marine. In the fifties the United States had almost the same tonnage as Great Britain, built up by reason of extensive resources of timber in New England readily accessible to the sea. The introduction of the use of iron in place of wood and of steam in place of sails gave Great Britain an advantage that resulted in the practical disappearance of the American merchant marine from the high seas.

These advantages of her coal reserves, however, are no longer as important as they were formerly. Her resources, indeed, are still ample for her requirements, but other countries have discovered coal reserves. Her 190 billion tons are insignificant compared with 3500 billion tons in the United States, 1250 billion in Canada, 1500 billion or more in China. She has only about four per cent of the world's known reserves. A great deal of her coal is of better than average quality, and high-grade steam coal is abundant, and there is a fair supply of coking coal; but of the major producing countries, she is most rapidly approaching the point of ultimate depletion of her resources. However, this point will not come before a hundred years' time at the minimum estimate. With improved methods of use, etc., it may be delayed several centuries. For her industry, coal is by no means a limiting factor, but neither is it so distinct a competitive advantage as it used to be.

The advantage derived from well-balanced cargoes, made possible by export of coal, seems to be fast disappearing, if indeed it ever was as great as has been popularly supposed. The discovery of new reserves in foreign countries has gradually restricted the radius of British exports. Thus South Africa uses coal from Natal; receipts of Welsh coal in 1912 amounted to less than a tenth as much as in 1902. Australia supplies the Pacific. India will soon disappear as a market; her imports are obtained from the Far East and from Africa. Argentina's requirements are supplied *in spite of* an excess of outgoing cargo from the United Kingdom. Over a third of the ships to South America are forced to return with consignments to continental ports, or to pick up cargoes in the United States. And coal from North America is now beginning to compete.

Normally, most of the British coal finds a market in the Mediterranean countries and Germany. Egypt sends cotton in return; and ships delivering coal in Greece pick up return cargoes from Turkish and South Russian ports. Italy, France, and Germany are by far the largest customers (prewar), each taking about 15% of her total exports. These are all countries to which there is already a heavy excess of outgoing cargo, whose purchases of coal would seem to exaggerate rather than diminish the discrepancy. Ships delivering coal at Hamburg, however, obtain cargoes from the Baltic ports of Russia and Finland; and Italy receives most of her coal from ships bound for India via the Suez. As the coal they carry cannot compete with eastern coal on the further side of the Canal, they drop it at Italian ports, thus reducing to some extent at least the distance they must travel under ballast. In any case, European markets, as we have noted, are of declining importance to the United

States, and consequently any advantages Great Britain might enjoy in trading with them are of little immediate interest.

The relative advantage of her coal reserves in shipping is eliminated by the substitution of petroleum for fuel. In 1897 Rudolph Diesel invented an engine to burn crude petroleum. This has made possible such important economies that it has been widely adopted in ship construction. Fifty per cent of the British navy are oil-burning ships. The engine itself has an over-all efficiency of 32%, far greater than that of any before invented. A ton of oil has the calorific power of a ton and a half of coal, and at the same time occupies less space than one ton of coal. Being liquid, it can be stored anywhere in the ship, thus utilizing the least valuable space, while coal must be stored close to the boilers amidships, the best cargo space in the whole boat. As a liquid, morever, oil can be much more easily loaded on board. It takes less time to bunker than coal, and thereby permits a quicker "turn around" — practically equivalent to an increase in the number of ships in active service. It is possible to bunker at sea from a tanker, thus avoiding the necessity of going out of the direct route to replenish supplies. It reduces the labor of stoking by 75%.

The advantages of petroleum might have proved fatal for British supremacy on the ocean had not the British Admiralty been prompt to appreciate the situation. It was perceived that, with the meager resources of petroleum of Great Britain, and the enormous production of the United States (two thirds of the entire world's output), the advantage of fuel supply must immediately pass from her hands to those of the United States. British statesmen and business men were equal to the new situation. Without delay they entered upon a policy of acquisition of petroleum resources throughout the world. British control was extended in Roumania and Russia; they obtained an exclusive right, May, 1901, to exploit over a period of sixty years the resources of Persia, covering an area of 500,000 square miles. Other British oil interests obtained concessions in Mexico and South American countries, and in the Far East. An exclusive agreement was arranged with the Netherlands for the exploitation of her East Indian oil fields, and with France to exploit those of Morocco, Tunis, and Algeria. Today there is not a single important oil-producing country in which Great Britain has not control of large resources. She has planned and carried through, amid the turmoil of the recent events, a monopoly of perhaps two thirds of the world's petroleum reserves. With oil fields and oiling stations under her own control and conveniently situated along the great trade routes, she is in a position to pass without too great inconvenience from a coal to a petroleum basis.

To what extent these prompt measures may be able to offset the loss in the advantage of her coal reserves cannot yet be predicted. New oil fields will undoubtedly be discovered, and now that the United States has awakened to the significance of rapidly approaching exhaustion of her own reserves, it is probable that Americans will have a proportionate share in the discoveries. The question of monopoly of resources will become one of the vital political questions of the century, and possibly some solution will be found in compromise.

Whatever may be the outcome of the oil controversy, Great Britain's coal no longer presents any great advantage from a competitive point of view, either in industry or in assisting the development of her foreign trade and shipping. It remains simply an item of export to near-by European countries, and as an essential factor in her domestic industry, an index of her industrial prosperity.

From this last point of view, as a measure of industrial activity, Great Britain's coal output is of decided interest. Until 1898, the United Kingdom was the greatest producing country in the world. Since that year, the United States has taken the lead, and in 1913 we mined almost double the tonnage produced in Great Britain: 509 million tons, or 42% of the world's total, to her 287 million tons, or 22%. Our per capita consumption is still only equal to that of Great Britain. This is partly due to our extensive water power development, 9.25 million h.p. — greater than that of the whole of Europe (8.9 million h.p.), and equivalent to 50 million tons of coal. While the British per capita consumption, however, has increased less than 33% in fifty years, ours has grown at a rate of 33% every decade during the same period:

Great Britain's Production, Exports, and Per Capita Consumption of Coal

	Production	Exports	Per Cent of Output Exported	Consumption (Per Capita)
1850	56.0 mil. tons	3.8 mil. tons	6.8%	1.91 tons
1860	80.0	8.4	10.5	2.49
1870	110.4	14.1	12.8	3.11
1880	147.0	23.9	16.3	3.56
1890	181.7	38.7	21.3	3.81
1900	225.2	58.4	25.9	4.08
1910	264.4	84.0	31.8	4.00
1920	229.5	(45.0 est.)	(20.0 est.)	(4.10 est.)

An increasing proportion of the British output, it may be observed, is being exported. She may be able to continue this export trade for many years, but it would be far better for her to use her coal for her own industries than to send it to competitors. "A nation which exports coal," says Eckel, "is draining itself of its lifeblood. It is the most expensive thing to export, except men."

Far more serious, however, is the suggestion that the increase in coal exports coincident with the contraction of radius for export and for balancing cargoes chiefly to the Mediterranean region, must indicate a decline in her competitive advantage in manufactures: that she is obliged to use coal to pay, directly or indirectly, for her imports of food and materials; that her population has outgrown its own earning capacity, her industries no longer produce sufficient value to command the food and materials necessary for their own maintenance, and she is forced to draw upon her natural resources. She may be like the man whose style of living has become too expensive for his income, and who has to pay his debts out of his capital.

Conclusion

Our interest in the United Kingdom relates to her strength as a competitor. Although the British Empire as a whole is richly endowed with abundant resources, they will be accessible for British industry only if British industry is strong enough to maintain a centralized Empire. But our survey of the key industries in the United Kingdom reveals that the conditions which led to their original supremacy no longer obtain. Forced partly by circumstances beyond control, they have diverged from the basic principles of capitalistic production. The iron and steel industry reflects this reversion in its own stagnation; and coal, which no longer offers a particular advantage in industry or in trade, gives corroborative evidence as an index of the general industrial situation.

Whatever may become of the oil controversy, the single advantage of extensive control of oil resources cannot offset the more basic tendencies. Great Britain's supremacy on the sea, it is true, originated partly from her advantage in accessible coal for fuel. In the middle of the century American shipping was in very close competition with British:

Tonnage of the British and American Merchant Marine in the Middle of the 19th Century

(*Millions*)

	1850		1860	
	British	American	British	American
Total tonnage . .	3.56	3.54	4.36	5.54
In foreign trade . .	2.19	1.59	3.18	2.50

It was chiefly the introduction of the use of iron and steel for ship construction and of steam in place of sails for propulsion that eliminated American competition. Moreover there were decided economies in concentration of the carrying trade in the hands of a single agent, while commerce between the two countries was supplementary.

Now, however, our trade is becoming competitive rather than supplementary, and Great Britain's advantage in shipbuilding, as we learned during the War, has declined or disappeared. Shipping depends upon commerce. History shows that the ascendancy of the great maritime states — medieval Venice, Holland in early modern times, and England in the 19th century — has always begun by their carrying their own goods. Decline has followed a decline in their competitive standing in foreign commodity markets. Whether we scrap or sell the ships we built during the War, the time is near at hand when we shall do our own carrying. The United States will supply an increasing share of the world's markets outside of Europe, and as a lending nation will be sought for assistance in promotion of foreign productive enterprise.

In short, from all sides our evidence is complete: Great Britain's competitive strength is on the decline.

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CHAPTER III

GERMANY

Germany's industrial revolution was made possible by political integration and the establishment of the Empire. Her autocratic government promoted large-scale industry, exercising control through the Banks and state enterprises, and assisted the development of foreign trade. The acquisition of Alsace-Lorraine, with the discovery of the basic process of making steel, and her Westphalian coal, gave a new impetus to her steel industry. The by-products of coke production and her potash monopoly have established her supremacy in chemistry. Through one mistake of her helmsman, Germany lost the original factors of her ascendancy, making her now comparable with her industrial neighbors. With her material supply less readily increasable, Germany may have to turn to quality production. But meanwhile she continues to produce cheap goods; and currency inflation has resulted in an ill-balanced home market and depreciated labor supply. Her prospects as a competitor of the United States are slight.

The Factors of Germany's Ascendancy

GERMANY'S industrial revolution is of such very recent occurrence that her expansion has taken hold of popular imagination, not only that of the Germans themselves, who have been perhaps among the first to appreciate their own progress, but of the whole world. "German efficiency" has become a by-word. Whether it will remain a by-word, whether Germany can regain the ground she lost by the War, anticipate her rivals in recovery, and compete with the United States in the world's markets, are questions of particular interest at the present time. To predict the future and best appraise current events, we must first turn back to look at the past, as in our study of Great Britain, to discover upon what basis Germany succeeded in establishing her ascendancy. It will then be possible to judge to what extent these original factors have been affected by the War and by subsequent events.

At the beginning of the 19th century, when the industrial revolution in England was already well started, "Germany" consisted of some three hundred tiny independent or semi-independent principalities, each governed by its own princeling remotely subject to the Emperor of Austria, each with laws and administration of its own. Trade between these petty states was obstructed by innumerable restrictions, by the variety of currencies in use, weights, measures, etc. Even within the larger states, local tariffs hindered trade. The Kingdom of Prussia had nearly sixty of these, affecting some 2800 distinct classes of commodities. With such absurdly cramped markets it would have been manifestly impossible, even with other conditions favorable, for Germany to have followed England's lead in industrial development.

By the close of the Napoleonic Wars, the number of states had been reduced to only 39, of which Prussia was the greatest, comprised in the newly organized Germanic Confederation. Still each state was by no means willing to relinquish any of its independent rights. It was not until 1834 that seventeen of the states, under pressure of Prussia, were finally persuaded to join in a tariff union, or Zollverein, permitting free trade with one another and establishing a uniform and common tariff wall for all outsiders. Domestic manufactures were thus able to benefit by the broadened home market, and were protected from competition of British goods.

The Zollverein suffered fluctuating fortunes. The southern states of Germany were very reluctant to enter the union, and Bavaria, Wurtemberg, Baden, and Hesse organized their own South German Confederation with Austria. In 1855, however, the Zollverein had grown to include all the German states except Austria, of whose power Prussia was too jealous, and Hamburg and Bremen, which insisted upon retaining their free trade ports.

In addition to its trade advantages, the Zollverein paved the way for the establishment of the German Empire itself. Prussia had started the 18th century as a little state with an area of about 15,000 square miles, what is now known as East Prussia, surrounded on three sides by Poland and Lithuania. By a series of alliances and victorious wars, mostly aggressive in character, she grew by 1815 to an area of 108,000 square miles. Further acquisitions of weaker neighboring states increased this, by 1870, to 137,000 square miles with a population of 23 million. Her victory in 1866 over Austria, at one time her feudal lord, gave her complete ascendancy among the remaining independent German states.

It was thus a very short step, under the patriotic enthusiasm of the Franco-Prussian War in 1870/71, to convert the Zollverein of more or less independent states into an Imperial Federation. To the victorious and powerful king of Prussia was given the title of Emperor, but the position added little to what he already possessed. In the Zollverein Council, composed of delegates from the several princes, Prussia's representative had direct control of seventeen votes out of fifty-eight, and presided over the body. In economic matters of international moment, Prussia's king virtually controlled the Council of the Zollverein. Through various military alliances, the armies of the states were united under the command of the Prussian monarch. The delegation to the Emperor of the powers to declare defensive war, make peace, arrange treaties, etc., was little more than the incorporation in the organization of the Empire of powers already existing in the hands of the king of Prussia. Similarly the Reichstag, a body supposed to be representative of the people, was a continuation of a like body under the Zollverein. Its authority remained limited in extent, and it could be dissolved at will by the Emperor and the Bundesrath. In short, the autocratic form of government traditional in the German states as independent sovereignties was continued under the government of the Empire of 1871 as a pyramid of autocracies with the Prussian king, the supreme autocratic power, as the apex.

The bearing of Germany's political history upon her subsequent industrial development was of utmost importance. Whatever may be our sentiments toward autocratic government in comparison with democracy — its exploitation of the people and the excessive power and responsibility vested in a single head — the fact cannot be denied that centralized administration permits advance along well-defined, preconceived lines of progress far more rapid than where such progress is left to the pull of contending interests. Under centralized government, objectives may be visualized decades before they are finally attainable. Conflicting interests may then be subordinated and supplementary interests encouraged in due measure until the final goal is achieved. Under democratic rule, the accomplishment of one administration may be wrecked in the next. Nothing is more fickle than popular sentiment. Probably Germany has to thank, above any other single factor, her autocratic, militaristic form of political organization for the widespread and perhaps exaggerated appreciation of her "efficiency."

Numerous important advantages have resulted. Instead of prohibiting industrial combinations, as we have done, the German government has not only permitted them but has even encouraged them. Prior to the War, her entire industrial fabric had been woven into a network of related industries. Savings were effected in the maintenance of sales organizations, and the wastes resulting from competition, duplication of effort, maladjustment of supply to demand, etc., were in great measure avoided. Materials could be purchased at better prices; middlemen and agents could be eliminated, and in short, full advantage was taken of all the well-known economies of large-scale organization.

Germany could allow this development of industrial power because her government was able to maintain a position superior to the industries. There was no danger, as in the United States, that the business interests might grow too strong and swallow up the government. Bank consolidation preceded industrial integration. Through alliances, branches, partnerships, etc., the banks of the entire Empire were reduced to five or six great groups. These groups were so broad as to be able to raise themselves above a narrow policy of immediate dividends, and to work in accordance with national interests, financing such enterprises or business undertakings, trade or shipping, as might be of benefit to the nation as such. And the great banks, representing such an enormous controlling force in the Empire, were under the influence and direction of the Imperial Reichsbank, with its five hundred branches distributed throughout the country. The Reichsbank in turn, although a corporate body capitalized by private means, was under direct supervision of the government. Its management was vested in the Imperial Chancellor, and by him delegated to the president of the bank and the directors. Further supervision was exercised by a board of curators consisting of the Chancellor and four other members. While the Emperor, through his Chancellor, controlled the finances of industrial enterprises, there was little danger of their becoming too powerful or effectually opposing the policies of the government.

Moreover, the government had other means of control at its disposal. Through the states' ownership of the railways, it was not only the largest consumer of coal and the heaviest purchaser of steel products — a customer to be given satisfaction at any price — but it could absolutely control the marketing of commodities through the determination of freight rates. In practice, rates were applied beneficial to such interests as conformed to national policy. As readily could rates be applied ruinous to dangerous enemies.

Foreign trade development came to be part of the national policy. With characteristic concentration of effort, every means possible was turned toward this end. Shipbuilding was assisted by direct subsidies, by specially reduced prices for iron and steel, by free admission of materials for ship construction, by low railway rates on materials shipped from interior points in Germany. Pooling agreements were encouraged between separate lines in order to coördinate services, avoid duplication, etc. Certain railways granted preferential rates on goods for export.

The banks, of course, were organized to furnish credit and stimulate commercial enterprise. It was absurd for Germany, as a competitor of England, to continue to rely upon British ships and banking facilities! Numerous branch banks were established in prospective markets, many of them under local names, such as La Plata Bank in Argentina, Banka Generala Romana in Roumania, and so on. Through the loan of capital to local enterprise, these banks were quietly establishing a control over the foreign markets for German products and the sources of raw materials — plantations in the Dutch East Indies, South America, etc.; mines in Mexico, Australia; oil wells in Roumania; silk filatures in China; railways, and so on.

The tariff system in Germany was used as a tool for the same end — to bring pressure on foreign countries in bargaining for special favors. Under cover of specifications designed to fit the products of particular countries, tariff rates at home were adjusted to favor or prohibit those goods while avoiding the appearance of discrimination.

The government offered direct assistance to individuals through its consular officers and commercial experts and through special publications for disseminating information about foreign conditions, laws and regulations, technical data, etc. Indirectly, the interests of commerce were advanced through education. Schools of commerce in Germany are of comparatively recent development. They are largely supported and controlled by the state governments, but it needed only a word from the Emperor to suggest what was desired. Every state of the Empire has contributed annually to funds set aside for the administration of commercial schools. The benefit of these schools in educating merchants, bankers, consuls, etc., can hardly be overestimated.

No opportunity was missed for the promotion of foreign trade. Even emigration was supervised and assisted by the government, for colonists, as the government fully realized, might be utilized to great advantage. They carry away with them tastes for articles to which they have been accustomed, articles made in Germany. German emigrants who enter commercial and financial fields of activity in foreign countries naturally favor business with their own friends and relatives — people whom they know personally, whose customs, business standards, and practices are perfectly familiar, with whose currency, measures, etc., they are acquainted. Not only is their own trade directed toward their Fatherland, but they influence the trade of other people in the community. It was indeed a far-sighted measure for the German government to establish its Colonial Society (1902) under general supervision of the Imperial Chancellor and supported by the Imperial Government.

By 1870, Germany had already emerged as an industrial country. Although only a third of her population was employed in industry as compared with 45% in agriculture, her exports of manufactures were considerably in excess of her imports, and amounted to about 40% of her total exports. Her exports of animals and foodstuffs were only 20 to 25% of the total exports, and she already had a heavy excess balance of imports, and also of raw materials for use in manufacturing. Nevertheless, in comparison with England at this time, and in comparison with her own subsequent development, Germany's manufactures were very backward.

Her chief exports of manufactured articles were textiles, particularly woolen goods; but the industry was still largely under the household system. The occupations of spinning and weaving were still carried on in connection with the raising of sheep. More than nine tenths of the wool manufacturing "establishments" employed less than five persons. In the cotton textile industry, less than 2% of the establishments employed over five persons. Steam engines used in the factories averaged each about 35 horse power!

One of the objects of the Franco-Prussian War — initiated by Bismarck's astute juggling of dispatches — was the acquisition of Alsace-Lorraine. With characteristic Prussian foresight, the new boundary line was drawn months before the Treaty of Frankfort, 1871. Before the initial bombardment of Strasburg, before the capitulation of Metz, a map "with a green border" had been published in Berlin which was followed with slight modification in the subsequent treaty negotiations. In addition to its military advantages, this territory was coveted by Prussia for economic reasons: for textile manufactures, and for iron. What Lyons was for France's silk textile manufactures, Alsace was for cotton tissues. The acquisition of Alsace, one of the oldest cotton manufacturing centers in Europe, added over two million spindles and 48,500 looms to Germany's three million spindles and 37,000 looms. Lorraine was one of the oldest iron mining regions of Europe, but at the time increased Germany's production by only 15% or so, for although she was known to possess enormous ore reserves, they were of relatively inferior quality. "Minette" ores, as they were called, were not only of low metal content, but contained too high a percentage of phosphorus. Phosphorus was very difficult to eliminate by the methods used at the time, yet if allowed to remain, it made the finished product extremely brittle.

It was not until 1879 that two Englishmen, Thomas and Gilchrist, discovered a new process of making steel whereby the phosphorus could easily be removed — simply by using a "basic" lining for the converter instead of the customary acid or silica lining. English manufacturers were not very much interested in the invention, for the acid process was well enough suited to the English iron, which is of low phosphorus content. Thomas accordingly disposed of his patents in Germany, where his basic converter, of course, exactly met the difficulties of smelting Lorraine ores.

Fortunately for Germany, also, her Westphalian coal, besides (1) being ample in supply — 53 billion tons or 21% of the total known reserves in Europe — was especially (2) suitable for smelting iron, (3) sufficiently near to the Lorraine ores on the one side, and (4) close to tidewater on the other, and therefore favorably situated for the export of finished products.

In the eight years following 1883, the output of Lorraine mines doubled; doubled again in the next decade and again in the third — an increase from 1.64 million tons in 1883 to 14.44 million tons in 1910 — and by 1913 reached 21.1, a 50% increase in three years. From contributing 14% of Germany's total output in 1880, Lorraine iron represented almost 60% in 1913. From an exporter of textiles, Germany became an exporter of iron and steel manufactures, which increased from 6 to 8% of her total exports in 1880 to over 20% in 1913.

The slag from the basic converter contains about 50% lime and 20% phosphoric acid, both important elements of plant food. The development of her Lorraine steel production yielded as a by-product a growing supply of valuable fertilizer. This in itself was no insignificant factor in contributing to Germany's rapid development. In agricultural resources, Germany is not well endowed by nature, except perhaps in the Rhine region; but the enrichment of the soil by use of fertilizers has made possible a greatly increased yield per acre. Exactly how far basic slag fertilizer has contributed and how much has been due to her potash, of which she had acquired a world monopoly by the annexation of Alsace, and how much again to other fertilizers, we shall not stop to inquire. The following statistics of the increasing yield per acre are suggestive:

Average Yield per Acre of Principal Crops
(*Bushels per Acre*)

	Wheat	Rye	Barley	Oats	Potatoes
1881/85	19.0	15.6	21.2	30.5	125.4
1886/90	20.3	16.0	21.2	33.2	124.6
1891/95	21.6	17.8	21.3	33.2	138.0
1896/00	26.2	20.9	28.0	41.0	162.0
1901/05	34.8	25.5	33.3	52.7	194.0
1906/10	30.0	27.1	35.0	55.0	202.0

Thus industry, by supplying fertilizer for agriculture, contributed indirectly to the support of its own population, and industrial expansion was not hampered by the limitation of meager agricultural resources or the necessity of applying immediately to foreign countries for foodstuffs.

Coke is used as fuel for iron smelting. The preparation of coke from coal yields by-products that have further contributed to Germany's greatness. Coke is the solid residue remaining from the dry distillation of bituminous coal. The coal is placed in ovens and heated to a temperature of 1000° F. or more, until gases and liquids contained are dissociated from the carbon and are allowed to pass away, leaving 75%

of the original coal as coke. At first the gases and liquids were allowed to go to waste. It was a serious problem how to dispose of the liquids effectually; the gases escaped into the air. It was discovered, however, that they contained materials almost as valuable as the coal itself! The gas can be used for illuminating and heating purposes. Liquid ammonia and ammonia sulphate can be utilized for fertilizer and refrigeration. Toluol is the most powerful explosive known — modern warfare would be impossible without it. Benzol is a first cousin to gasoline and may some day supplement the world's diminishing store of petroleum. Coal tar is the raw material for aniline dyes, numberless medical preparations, solvents, explosives, road dressing, preservatives for timber, stone, etc. A hundred and fifty-five distinct chemical substances are found in coal tar, of which only nine, so far, are used for making dyes. From these nine "crudes" are produced two hundred seventy "intermediates" — there are probably over two thousand possible intermediates. From the intermediates are produced today some fifteen hundred distinct colors. The colors have been classified into fifteen groups, and of one group alone, the "azo dyes," it is estimated that there are probably over three million different dyes.

England was the first to manufacture gas from coal, about 1800, and an Englishman named Perkins was the discoverer of coal tar dyes in 1857, but England's dye industry, after having attained a state of considerable development in the '80s, began to decline during the next decade, at the very time that Germany's iron production, and consequently her consumption of coke, was rapidly increasing. The first place soon passed to Germany — not so much because of her increasing coke requirements, for England still used probably twice as much, but rather because, under her more centralized government, scientific research was able to gain more readily the support it deserved. Scientific research requires an enormous outlay for equipment and for the support of scientists, who may spend a lifetime in achieving their results. To obtain adequate government support for undertakings of such uncertain nature in a democratic country, it is necessary to educate the mass of voters to an appreciation of the ultimate value of the research. Something may be accomplished by private capital contributed to institutions as a sort of charity, and generally in danger of being withdrawn if prompt "results" are not obtained; and some business concerns are sufficiently far-sighted and prosperous to maintain their own laboratories. In an autocracy, on the other hand, it is sufficient to convince the "powers that be," one or two men at the top, and ample support is forthcoming. In England too little encouragement was given to chemical research; in Germany laboratories were established and financed by the government. It is estimated that the supply of university trained chemists in Germany's chemical factories reached a ratio of one to forty work people — a ratio of science to labor nowhere excelled.

Common salt (chloride of sodium) and potash form the basis of the "heavy" chemical industry. In 1852, among the rich salt deposits near Stassfurt in the Prussian province of Saxony, were discovered almost inexhaustible beds of potash salts (estimated at 20 billion tons). Before this, potash used to be made by burning vegetable matter, for it has rarely been found thus free in nature. For some years, however, the natural potash was treated as waste material. Deposits were afterward found in Alsace, but they were little exploited, and Stassfurt became the greatest center of the chemical industry in the world. Sixty per cent of the output of the Stassfurt crude potash salts was consumed at home, half in the manufacture of fertilizer and the remainder for numerous other chemical products. The development of the industry is clearly indicated by the increase in production:

Production of Potash Salts

1861	2,000 tons
1871	375,000
1881	906,000
1891	1,371,000
1901	3,535,000
1911	9,607,000

It was not long before Germany had acquired preëminence in the world's chemical industry. It became an accepted fact, somewhat like Jack Horner of Mother Goose fame, that she was blessed with an inherent aptitude for this field of production shared by no other nation in the world. The importance of the industry passes far beyond any dollar valuation of products or of exports. The dye industry and the high explosive industry are so intimately connected as to be virtually one. Far more serious than the inconvenience occasioned in 1914 by the shortage of dyes, although naturally not so widely advertised or appreciated by the general public, was the alarming shortage of high explosive and other war chemicals. Incredible as it may seem, France herself depended upon Germany for most of the melinite used in her ammunition! The world slept in the happy security of the Hague rules for warfare, by which "it is expressly forbidden to employ poisons or poisonous weapons," but Germany knew that "he who makes dyes in peace can make high explosives and poison gases in war" — and knew that she had a virtual world monopoly of dye manufacture.

In Germany's industrial revolution, new industries have thus taken the place of the old. Textiles, formerly of first importance, have become secondary. Her wool manufactures are still scattered, without any true center of geographic specialization; a large number of the workers carry on their occupation in the home. The cotton mills, also, are small and widely scattered, though showing some degree of concentration and development along capitalistic lines in the Westphalian region — where coal is plentiful and the mills are more accessible for imports or raw cotton.

The primary factors of Germany's ascendancy, then, were first, her highly centralized form of government, which enabled her to pursue a single objective, and to utilize for its attainment every possible means at her disposal; and second, her annexation of Alsace-Lorraine. The iron resources thus acquired, and made available through the discovery of the Thomas process of smelting "minette" ores, became the very foundation of her greatness. Her steel industry has afforded the means of support both directly and indirectly for a great population: directly, in the industry itself and in foreign trade, and indirectly in the by-product industries and by promoting agricultural production. It was the foundation of her military strength: it created the man-power, the guns, and the ammunition.

Germany's Economic Position after the War

The chief disadvantage of a highly centralized government — since we have been extolling its advantages — is that so much depends upon the intelligence of the ruler. A single rash act, a hasty judgment, an ill-considered step of a weak or foolish monarch, may cast down to destruction the edifice it took years of patient, far-seeing endeavor to erect. The analogy is frequently heard: an autocracy is like a ship equipped with modern machinery, capable of high speed, easily steered. A democracy is like a clumsy raft. But a ship, if it strikes a rock or an iceberg, sinks in a few minutes with heavy loss of life. A raft may be always awash, but will still stay afloat.

By the Treaty of Versailles Germany restored Alsace-Lorraine to France; by her constitution, adopted on July 31, 1919, she became a republic. Germany has lost the original factors of her remarkable ascendancy. Will she be able to retain the position she reached under autocratic rule and based upon Lorraine iron, a serious competitor of the United States in the world's markets, or will she suffer decadence?

Germany's losses comprised chiefly raw materials and foodstuffs. Lorraine iron, Alsatian potash (8%), and Saar coal have been surrendered to France; Silesian coal and iron and eastern grain lands restored to Poland. The loss of a third of her basic steel output has doubtless curtailed her supply of basic fertilizer, five sixths of which she used at home. Nevertheless, she still compares favorably with her industrial neighbors.

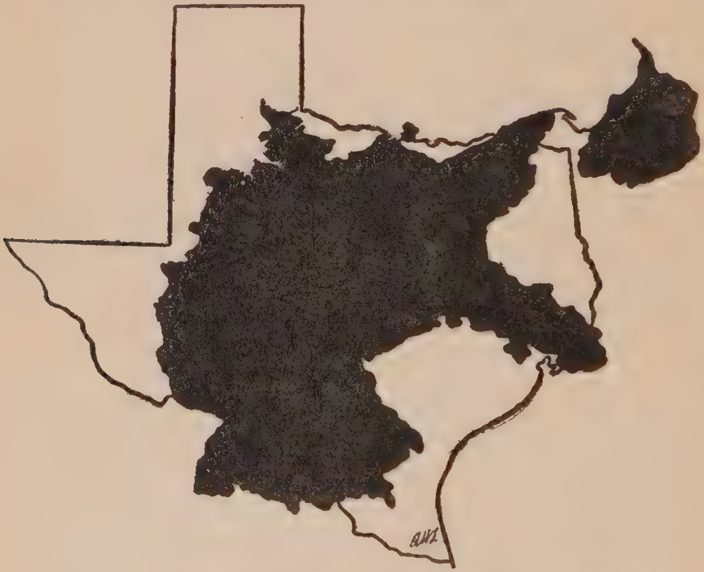

FIG. 12. Area of Germany. (Compared with Texas.)

Her Westphalian coal reserves, though only half the extent of Great Britain's, are of excellent quality and considered quite ample for more than four centuries' use at the 1923 rate of production. Belgium has an import balance of 15% of her total consumption, and Switzerland and Italy import practically all their coal.

Germany's losses of iron reserves will compel her to depend upon foreign sources for three quarters of the iron required by her finishing industries upon their pre-war scale. But Belgium, with an industry over half that of France, imports (1913) more than 90% of her iron, and Switzerland all. Great Britain has to import a third of what she consumes. Comparisons with Great Britain and Switzerland, however, might relate more properly, perhaps, to the textile industries, which are generally considered their most important, — analogous, as such, to Germany's steel manufactures. All the cotton for the British industry is imported, and 75% of it from countries outside of the Empire. Switzerland imports her raw cotton and her silk.

With regard to foodstuffs, in spite of her losses of agricultural lands in the eastern part of the "Reich," Germany compares to advantage with these industrial countries. Before the War, Great Britain used to import annually about $27 worth of food per capita, of which, by the way, $20 worth came from countries outside of the British Empire. Belgium imported, net, $18 per capita; Switzerland, $21. Germany's net imports of $7 per capita would seem to allow considerable room for expansion before she is reduced to the dependent position of the other countries.

Production statistics of the staple agricultural crops since the War, however, indicate that as a matter of fact no such dependence is necessary for Germany. If we compare the recent statistics for the German Republic with the pre-war statistics for the other countries, we place Germany in the least favorable position for comparison possible. Nevertheless, it will be observed that German production is exceeded only by that of Great Britain in the number of sheep, of Switzerland in cattle and goats, and of Belgium in wheat and sugar beets:

Crop Yield and Live Stock per 1000 Persons

	Germany (1921)	United Kingdom (1911)	Switzerland (1911)	Belgium (1911)
Wheat . . .	1,800 bu.	1430 bu.	930 bu.	2,130 bu.
Oats . . .	5,900	4520	1320	5,900
Rye . . .	4,450		480	3,280
Breadstuffs	12,150	5950	2730	11,340
Barley . . .	1,470	1330	1000	600
Potatoes . .	16,100	6200	6207	13,500
Sugar Beets .	133 tons		6 tons	200 tons
Cattle . . .	280 head	262 head	383 head	244 head
Swine . . .	267	94	151	165
Sheep . . .	100	675	43	25
Goats . . .	72		90	29

Germany's domestic per capita production of bread cereals, wheat, oats, and rye, is almost exactly what Great Britain used to *consume* per capita (production plus net imports) before the War; namely, twelve bushels. This leaves out of account entirely Germany's potato crop, which is more than two and a half times as large as Great Britain's total consumption (per capita) in normal times. Germany, on Great Britain's diet, it seems, would be practically self-sufficient with regard to staples. An excess of imports would indicate either a demand for luxuries or a tendency to eat more than is necessary.

Germany lost her merchant marine under the peace terms, but Switzerland, of course, has no ships, and Belgium has less tonnage in proportion to her trade than Portugal, Greece, Finland, or Latvia. Moreover, Germany had scarcely surrendered her ships before she had effected an arrangement with American interests whereby the German shipping lines were to maintain their original organization with the American-owned ships as carriers.

In short, the War has brought Germany under a new set of economic conditions. She has been reduced to a position very similar to that of Great Britain or (except in size) Belgium or Switzerland: a country endowed with a highly developed industrial organization — her finishing industries — but largely dependent upon outside sources for her raw materials. *Is such dependence a handicap?*

Prospects of Industrial Recovery

Prices for staple materials are fixed in the world market. With the improved facilities of modern transportation and communication, a country can buy its materials from abroad as cheaply as customers actually in the producing country. Manchester can obtain her raw cotton at practically the same price as mills in New England. Of what importance is the mere re-drawing of national boundary lines? The iron ore is still in Lorraine; the mine owners, whether as French citizens or as German, are just as anxious to sell their product. The consumer is as necessary to the producer as the producer to the consumer.

Have the intricacies and interdependence of civilization, then, eliminated the simple laws of primitive life? In a primitive society, the man who can step from his door and pick a plaintain or banana whenever hunger prompts can adjust his "production" to his requirements more readily than another who must stop to bargain for his supply or must walk some distance to gather it. More probably, modern conditions have obscured rather than eliminated the basic factors. Today "remoteness" includes a great variety of elements, such as differences of language, customs, laws, political control, etc. They operate as "risks," real or imaginary, which, in turn, affect business through invisible channels, by simply diverting capital and ability into other fields of enterprise. Conservative industry prefers to build upon secure foundations; capital is easily obtainable only if returns are "in sight." By stressing the obvious "affirmatives" it is easy to overlook the elusive "negatives."

But whether dependence is or is not a handicap in general, the establishment of a new boundary between France and Germany introduces a more obvious limitation. Lorraine ore, by becoming French property, is brought within the sphere of French national aspirations. If it should be the ambition of France, as a nation, to develop her iron and steel manufactures, she can readily impose export duties, grant special subsidies, or take control of the mines herself. The first consideration of the observer must be to ascertain the attitude of France toward her steel industry.

The new situation in which Germany may thus find herself should be contrasted with that which she has enjoyed since 1871. Her ascendancy, as England's at the time of the industrial revolution, was made possible by the removal of checks upon the "increasability" of important factors of production. The Treaty of Versailles has reversed her position by imposing a degree of inelasticity, perhaps a positive curtailment, upon the supply of her most essential raw material.

Germany May Have to Turn to Quality Production

In a similar situation, brought about less abruptly, England has been turning from capitalistic or machine production, with its low labor requirement and high material consumption, to quality production. All labor must be employed. Where labor is abundant but materials restricted in supply, it becomes necessary to apply more human labor per unit of material, and to employ three men for production rather than one man and a machine. The basis of competition tends to become *quality* rather than *quantity*. Switzerland, more obviously handicapped by her inaccessibility, has concentrated entirely upon luxury goods. Her three primary industries are fine cotton tissues and embroideries, silks, and watches, — goods demanding the minimum of raw materials for the maximum of value. Similarly we might now expect Germany, deprived of Lorraine iron reserves and forced to depend upon foreign sources, to turn from quantity to quality production.

This tendency should be hastened by payment of her indemnity. Whatever arrangement may finally be made (at the moment of writing, settlement of the indemnity question seems as remote as ever), it is unlikely that Germany will be allowed to escape her obligations. But by whatever method she may be forced to pay — except by the surrender of German-owned securities representing properties in foreign countries — the effect should be to render more urgent a prompt change in the technique of her production. In ultimate analysis payment must consist in an excess value of exports over imports, that is, in the situation indicated, a minimum purchase of materials and a maximum value of exported finished products. Germany's best interests dictate a policy whereby she may retain and strengthen her assets: her finishing industries, her export organization, and her labor supply.

Events during the post-war years seem to indicate that, if this is indeed Germany's best hope of future prosperity, she has failed entirely to grasp the situation. The great industrial leaders have proceeded in the direction to which they have been accustomed. Eager to recapture the markets lost during the War, but confused perhaps by the temporary and apparent advantages afforded by currency depreciation, they have exported "five and ten cent articles," cheap, low-grade goods. This may have been considered good advertising, for every article bears its stamp "Made in Germany." Doubtless it has discouraged many an American manufacturer from entering into foreign trade. But it has had the boomerang effect of causing countries to raise their tariffs — a barrier far more easily raised than reduced — and it has postponed Germany's own progress toward recovery by the more permanent consolidation of her industries on the quantity basis and the firmer establishment of a reputation for cheap grade goods: the production of articles requiring heavy expenditure of raw materials, yielding a low margin of profit per unit, and consequently depending upon a very broad consuming market.

The effects of Germany's industrial policy have been obscured by the course of her currency inflation and depreciation of the value of the mark. While inflation is in progress, business enters upon a grand boom. The immediate effect of inflation is to increase the total national purchasing power, and, after that, commodity prices. When the government meets its expenses with money drawn from taxes, the general purchasing power of the country remains unchanged. The taxpayers lose to the extent that those in service of the government gain. But when "fiat" money is used to pay the state's debts, the citizen suffers no reduction of purchasing power through taxation, and the government employee receives his pay as usual. Both enter the commodity market with their "effective demand" unimpaired. Since the supply of commodities on the market at any moment is comparatively fixed or inelastic, the sudden increase in demand stimulates a disproportionate increase in prices.

The rise in retail prices is reflected in wholesale prices. To the manufacturer, with his wage rates for labor determined largely by contract, with materials and supplies sufficient to carry him for some time already in store, with his rent definitely fixed, rising prices mean increasing profits. Exporting to foreign markets, they are able to undersell their competitors.

But the prosperity based upon inflated currency is temporary and more apparent than real. The German exporter has found obstacles in the way of his trade. Bankers abroad are unwilling to carry suitable balances of shrinking marks with which to finance imports into their countries, and special arrangements have to be made to cover the risks of fluctuation of exchange rates. In spite of the widespread fear of German "dumping," due to the supposed selling advantage from her depreciated currency, the total value of Germany's exports in 1920 was only $1207 million, or half that of 1913 ($2380 million). Owing to the decline in purchasing power of the dollar in 1920, this would probably indicate, in terms of the pre-war value of the goods, about a quarter as much as in 1913. The value of Germany's exports during the year from May, 1921, to the end of April, 1922 (the latest figures available at the moment of writing) was $874 million. The false impression gained in this country has been due, partly perhaps to propaganda spread in a field ripe to receive it, but more probably to the fact that, while successful transactions make a deep impression upon the popular mind, the numerous transactions that are not effected of course pass unnoticed.

More important for the industrial future of the nation, however, has been the result of inflation in the domestic market. The exorbitant profits of the industrialists have been gained at the expense of the other party to the contract. The wage earner in particular has suffered, for wages have constantly lagged behind prices. The wealth of the nation has gradually concentrated in the hands of a comparatively small group. The vast majority of people in Germany have been left destitute, their effective demand for commodities reduced to the bare necessities. Sound prosperity of the modern industrial nation requires a broad domestic market.

To expect that the low wages in Germany will constitute for her an advantage in competition with our manufactures is without foundation. Economic slavery is not conducive to efficiency in production. Health and reasonable contentment are requisites. In Germany contentment has disappeared for many years to come. Writers sometimes refer lightly to "financial collapse" as if it were merely a temporary hardship. They point to the speedy recovery of the United States after the Revolution, and to France after the collapse of her assignats in 1789. But these instances are by no means comparable with Germany. France and the United States a century ago were agricultural countries. Industries were carried on in the cottage, on the farm. Nearly every one had land readily accessible on which to raise necessities of life. Even as it was, the misery and suffering in Paris, according to historians, was intense. Germany, on the other hand, has an enormous population closely crowded into cities — half her total population in cities of over 5000 inhabitants. Barter on such a scale is unthinkable. Requisition of food supplies by the government, as Russia discovered, is difficult. It is scarcely conceivable that the intricate and delicate organization of a highly developed industrial nation can be kept intact under such conditions.

What can be in store for the future? Imagination fails to carry us beyond the moment, but Germany's prospects appear dubious indeed. Her high-grade goods, such as surgical instruments, etc., for which she has been noted, will probably recover their position in world trade. In regard to cheap goods, her low-priced labor may be offset by cost of materials. She will cease to have the advantage(?) of a depreciating currency — the end is already in sight — and she will find that, without this, she cannot make a profit, especially over tariff walls. In medium-grade goods, she is at once handicapped by the lack of easily accessible materials, and her low wages mean inefficient labor. Whatever may be the moral aspects of Germany's situation, the prospect of her resurgence as a competitor of the United States seems exceedingly remote.

CHAPTER IV

FRANCE

Lorraine recovered, can France duplicate Germany's achievement? France, before the War, was decadent. Various reasons for this are offered, but the fundamental cause was her lack of coal. The War has placed France in a new economic situation. Increased productive capacity, iron and coal reserves, may afford opportunity for transition to capitalistic production. Although her Sarre coal is inferior to Westphalian in location, quality, and extent of reserves, and she must continue to import some coke for her blast furnaces, her requirements will be available in a buyers' market. The Sarre deposits are adequate for the balance, especially when supplemented by electrical power. France will concentrate, however, upon her colonial markets, rather than compete with American industry.

Pre-war Decadence

The talisman of Germany's ascendancy, Lorraine, has returned to France. Can France now duplicate Germany's achievement? May we expect to see her suddenly spur forward and recover her lost position as the most powerful nation on the continent of Europe? Will she become a competitor in place of Germany in the foreign markets of the world?

France is pointed out as a nation in process of decay, fallen from a position of preëminence she had enjoyed for many centuries. From the first, no country had so readily absorbed Roman language, laws, customs, civilization. After the fall of the Roman empire, no nation did so much to restore civilization in Europe. French became, and remained until very recently, the court language, the speech of the aristocracy and the governing classes. Little more than fifty years ago, France was equal to Germany in both area and population. She was superior to Germany in industrial development. Over a third more shipping entered her ports than those of Germany. Her total foreign commerce in 1872 was a sixth greater; her export trade, 60% larger.

Since the '70s, however, France's population has remained stationary, is now only three fifths that of Germany. Her foreign trade before the War (1913) was two thirds as large and her exports 70%. Her industries have stagnated, unable to compete with those of England and Germany. Only such products and such qualities as do not compete directly with commodities from the more progressive countries have been able to survive in open markets. Exports of cotton textiles were exceeded by silks and were scarcely more than half as strong as woolens; and in all, she could market abroad only the fine qualities, satins, cretonnes, tulles. Women's clothes and lingerie are important items of export, and laces, nets, artificial flowers, fancy novelties, etc. Her medium and coarse grade goods, while predominating in actual production, find sale only in the domestic market and in her colonies, within the zone of tariff protection.

Agriculture remains the national occupation. The census shows that 40% of the persons gainfully employed are engaged in farming. In Germany and in the United States only 33% are farmers; in Great Britain, 8%. Fifty-six per cent of France's total population lives in the country or in villages of less than 2000 inhabitants. In Germany, 40% are rural dwellers; in the United States, about 50%. France has only seventeen cities with over 100,000 population, the United States has sixty-eight, Germany forty-one, Great Britain thirty-eight.

Many and diverse explanations have been offered to account for France's decline. Irreligion, looseness of marriage ties, alcoholism, racial sterility, have been suggested. The French are accused of lack of energy and enterprise, too great love of ease, perhaps too great prosperity in the past, leading to general racial decadence. It is asserted that the high protective tariff has brought inertia.

Some economists point to France's specialization on the production of quality goods. The market for such articles is restricted. With the spread of democracy and abeyance of luxurious display by aristocracy, the consumption of goods of fine quality increases at a slower rate than that of medium grades. An elastic market is essential for industrial progress. Without such a market, France's industries have gradually atrophied, her national growth has ceased.

France's agrarian movement — in contrast with that of England, where the inclosure acts eliminated the small farmer and made available a suitable labor force for industrial development — resulted after the Revolution of 1789 in the breaking up of large estates belonging to the nobility and clergy and distribution of the land in small holdings to the bourgoisie and peasantry. There was no general inclosure movement in France. The process of subdivision has been further promoted, also, by the Code Civil, which provides for the equal division of property among the children at the father's death — though the slow growth of population has made this less effective than it might have been. Today over four fifths of the land holdings are of less than twenty-five acres in size.

Industry in France has been unable to offer sufficient attractions to induce the farmer to relinquish his land voluntarily to seek city employment, and has been forced instead to go for its labor to the farm. While concentration and factory production have been developing in England and, since the '70s or '80s, in Germany, cottage industry and the letting-out system have persisted in France. In her cotton textile industry, 20% of the looms are hand looms. In the Loire-Rhone district where the best cotton tissues are manufactured, hand looms are actually almost as numerous as power looms. Wool yarn for the weaving mills of Roubaix, Tourcoing, and Caudry was still collected (pre-war) from the spinning wheels in the villages, where industry was supplemented by agriculture. In some places the factory serves as a central power station to supply cottages clustered about, near and far, with electricity for their small looms.* Even where capitalistic production has been fully established, the plants are generally small in size, their equipment antiquated, and they have not yet attained any great degree of specialization and standardization of product. While in England an entire factory will be equipped to produce goods of a single grade, in France mills a fraction the size will spin or weave a range of "counts" from coarse to the very finest.

This tendency toward the production of quality goods may have been further promoted by the natural inclination of French talent. France is the meeting place of northern energy and southern culture and æsthetic taste. It is natural there should be less incentive to develop along the uniform, standardized lines of manufacture; that France should confine herself more and more exclusively to luxury goods, where variety and individual taste are the primary elements, and uniformity is a negative quality; where the old-fashioned mule spindle, which is better suited for fine counts, is preferred to the high-speed ring spindles; where the small factory is best suited to handle the small orders of custom production.

But factors such as these — industrial organization, distribution of land, tariff regulations, moral or religious retrogression, etc. — are all aspects of human or social adaptation to environment. An individual is a complex of various qualities, any of which, within certain limits, may be "brought out," or acquire exceptional value, under special conditions. A cobbler may become a general, a country lawyer, a president. Or a given talent may be applied to different ends under different circumstances. In New York, the artist turns to advertising, while in Italy he might become famous as a landscape painter. Similarly, but within broader limits, social groups may benefit by the qualities lying dormant in their members. Under new or altered conditions these qualities may assume value and may be applied to new objectives. Before we can appraise the due importance of the human factors, therefore, we must investigate the more fundamental, or "given," material factors.

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* Of the 63,000 factories using electrical power in 1912 in all industries, the usual horse power was between five and ten; the average, 51.3 h.p., was due to a few very large concerns.

France is notably deficient in one primary element only; namely, coal. Before the War, her reserves amounted to less than 2% of the total reserves of Europe, little more than 4% of Germany's, and 3% of Great Britain's. More immediately significant, the coal she had was widely scattered and difficult to mine. Her best coal field, the Valenciennes basin, is in the northeastern part of France, in the Département du Nord, extending into the Département Pas de Calais. Sixty-eight per cent of the coal produced in France in 1913 came from this region, but the coal-bearing rocks are badly folded and "faulted," and heavily overlaid by barren strata. Engineering difficulties, uncertainties of occurrence of seams, the necessary depth of mines, some of which are over 3000 feet deep (the average in Pas de Calais being over 1000 feet), greatly increase the expense of mining. The price of this coal, the cheapest in France, was $4 a ton at the mine in 1913 as compared with German Westphalian coal at $2.80 and American coal at less than $1.25. Sufficient evidence of France's relative position is afforded by the fact that her coal imports — backward as her industries are — amounted to almost half her domestic output.

This paucity of coal and its wide dispersion is sufficient to account for most of the present characteristics of French

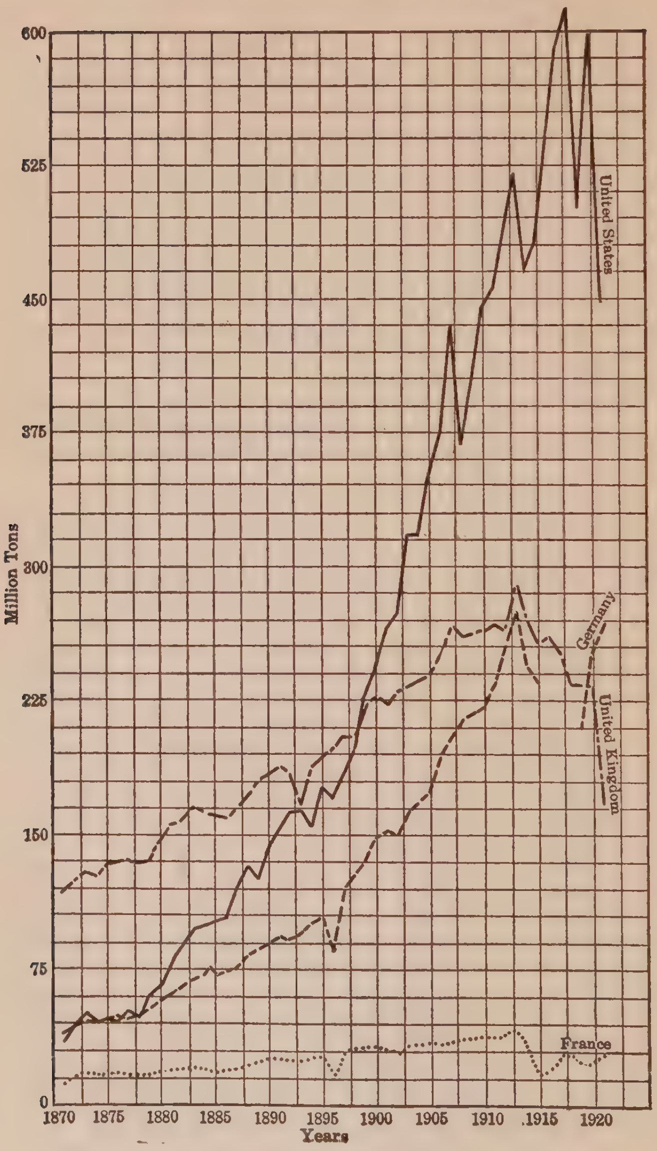

FIG. 13. Coal Production of the United States, the United Kingdom, Germany, and France.

industry. For coal is the first essential in capitalistic production. Without it France was seriously handicapped from the start. Her industries underwent less transformation or readjustment than England's or Germany's. Before capitalistic production fairly reached the continent from England, France's woolen industry was located chiefly in the Départements of Ardennes (42%), Nord (28%), and Marne (19%), having grown up in close proximity to the sheep pastures. Cotton manufacturing centered about Rouen (40%), near the sea and easily accessible for the imported raw cotton. It was also favored by the water of the Seine, which is particularly suited for the finishing processes. A flourishing industry also grew up in Haute Rhine (Alsace), doubtless profiting by the water power. Silk textile manufacture was established in and about Lyons (Departments of Rhone and Loire), where silkworm culture had been introduced from Italy by Francis I in 1515. The iron industry was far more widely scattered than the textile manufactures. The chief centers were Ardennes (8%), Haute Marne (7%), and Nord (6%). The coal output was insignificant, about four million tons per annum during the decade, 1840/50. The total value of coal mined was only 5% of the value of wool manufactures. Charcoal was still used for smelting, and water power for manufacturing.

Capitalistic production, implying the use of coal, introduced an element of attraction toward the sources of coal supply. By 1913, the Département du Nord had become the major industrial center of France. The density of population, 850 per square mile, was higher here than in any other department except that of the Seine, which is only 185 square miles and the seat of Paris. Manufactures of wool, cotton, linen, and steel are all located there. The influence of coal as an attractive element, however, was less powerful than if it had been cheaper to extract. French manufacturers could not compete with Great Britain and Germany on the basis of quantity production, but depended for competitive advantage on quality, variety, and taste of their finished articles, possible only with handwork and production in small establishments. Thus antiquated mills were retained. There was no reason to introduce expensive specialized machinery unsuited for the type of article wanted. There was little advantage in trying to induce labor to leave the farm. Nor was the necessity so strongly felt to remove to the coal center.

Wool manufacturing moved across from Ardennes, but probably more in order to have easier access to foreign wool supplies than to profit by nearness to French coal mines. The transfer may have been facilitated somewhat by the change from woolen manufacture to worsteds. Cotton textiles, however, are still found in Normandy (Rouen) and the Est (Vosges) as well as the Nord, though the largest establishments, as might be expected, are located near the coal supply. But, contrary to expectation, little weaving is done in the Nord; it specializes on fine spinning, producing almost all the fine yarns of France; and the equipment is less up to date than in the Est or in Normandy. These apparent contradictions may be explained: the humid climate, like that of England, is particularly favorable for fine yarn spinning; spinning, even of fine yarns, requires no special personal taste or skill (unlike weaving), and is therefore suited to capitalistic production; and the finest counts can be best spun on mule spindles rather than the modern ring spindles. Normandy's cotton textile industry is now stationary, in spite of the apparent advantage of proximity to the sea. The Est has shown the most rapid development in recent years and has passed the Nord, but the factories are small, non-specialized "commission mills." The industry was augmented by immigration from Alsace over the new national boundary line after '71, and has been vitalized, perhaps, by readier "vertical mobility" thus occasioned — there are more self-made entrepreneurs in the Vosges district than elsewhere in France. In the vicinity of Lyons are made the finest cotton tissues, luxury fabrics, attracted perhaps by the similarity in production and marketing of the silk textiles that are also concentrated here. It is significant that 75% of the hand looms for cotton weaving in France are found in this region. Silk manufacturing centers here to be near the domestic silk culture and to imports of raw silk from Italy and the Far East. Coal for the industries is taken from adjacent mines.

France's iron industry is supplied almost entirely (90%) from the minette iron reserves, the greater part of which were left her unwittingly by Bismarck in 1871, owing to faulty geological knowledge at the time. The metal content of the ore, as already noted, is low, 24 to 41%. It does not pay to ship grades below 33% on account of the heavy charge upon the valueless rock material in which the metal is contained. It has been found cheaper, therefore, to transport coal to the ore for smelting. Thus 57% of France's pig iron was produced in Meurthe and Moselle, and only 14% in the Département du Nord. Of her manufactures, however, 27% were made in the Nord and 22% in Meurthe and Moselle. The remaining 50% is still scattered in the original producing localities, the Loire retaining her early importance with 10%.

Prospects of an Industrial Renaissance

The War has animated France with a wonderful spiritual regeneration. With 1.5 million soldiers killed, one million disabled, and two millions in the invaded regions, France lost a fifth of her total productive population and 57% of the men of 19 to 32 years of age who were mobilized. Yet the courage of Verdun, ardor and energy, seem to have taken possession of the entire people, and France has turned resolutely to the task of reconstruction. Instead of falling back in exhaustion from her tremendous effort, demoralized by the awful nervous tension of a second invasion while the memory of the first was still fresh, she is actively trying to replace what was destroyed with improved plant and equipment. She has awakened to a full appreciation of the advantages of mass production, of industrial combination, of efficient sales organization, etc. Her engineers are studying American methods. American engineers are being brought over to France. Her objective is an industrial renaissance.

The chief causes of the development of capitalistic production in our country, aside from our extensive material resources, have been the relatively small supply of high-grade labor and the steady inflow of unskilled immigrants. The war has left France in a somewhat analogous position. Her heavy losses of man-power and the necessity of maintaining a large army now to enforce observance of the peace terms have created a serious shortage of labor. At the same time, she has acquired new fertilizers: the potash salts near Mulhouse (Alsace), estimated at 1.5 billion tons of crude salts, richer in K_2O and more readily refined than the Prussian deposits, and the phosphoric slag from the Lorraine blast furnaces. These, in addition to the phosphates from her African colonies, Tunis and Algiers, will make possible a greatly increased yield of farm produce in proportion to the agricultural labor employed. Thus French industry may be able to draw more heavily upon the rural population, employing young persons who were boys and girls in 1919.

Although France has been predominantly an agricultural country, probably self-sufficing if need be, the yield of her crops per acre planted is about 66% that of Germany. Much of France, especially toward the south, is infertile except for the rich river valleys. But neither is Germany, outside of the Rhine valley, a naturally fertile land. The high yield in the eastern grain regions was obtained by liberal application of fertilizers. She used most of her Thomas slag and ammonia sulphate from the coke furnaces; and she had a monopoly of potash salts. France was confined to phosphates.

The recovery of the Alsatian cotton textile industry, although now with only 800,000 spindles and 45,000 looms (compare 1871, on page 77), combined with that of the Est, gives France the most considerable cotton spinning and weaving district on the continent of Europe, and she becomes the third strongest cotton manufacturing country in the world, exceeded only by the United Kingdom and the United States. The destruction of her woolen industry in the invaded territory was also partly compensated by that of Alsace (550,000 spindles).

The addition of the iron reserves of "Lorraine Annexée," 558 million tons (Fe) known reserves, to those of her own Lorraine, 990 million tons (Fe), place France in possession of almost half the iron of the entire continent of Europe, deposits that cannot possibly be exhausted within a century. The output of ore in Lorraine Annexée in 1913 amounted to 21 million tons. This is just about equal to France's total production. To this may be added Luxemburg's output of 7 million tons per annum, for already France has acquired large interests in her blast furnaces, and she has voted to enter the French Customs Union. France, with her production more than doubled, according to 1913 figures, is in a position to supply over a third of all the metallic iron consumed in Europe's steel industries.

All the coal deposits in the Sarre Basin, according to the peace terms, have become the complete and absolute property of the French State. The estimated reserves of the Basin amount to 16.5 billion tons. France's pre-war reserves were less than a quarter that amount. With 20 billion tons at her disposal, France now controls 8.3% of the coal of Europe, 18% outside of Great Britain. The pre-war output of the Sarre mines, 17 million tons, almost equalled France's imports before the War, and it is claimed that the output can be increased to 25 or 30 million tons per annum.

Lastly, the markets for luxury goods have been greatly curtailed, owing to the after burdens of the War. Great Britain used to be France's chief customer, taking half to two thirds of her exports of silks and other delicate fabrics, articles of clothing, etc. But that was before the War. England had a large aristocracy; she was prosperous. She is now burdened with heavy taxes and can ill afford luxuries. In western countries, democratic ideals demand approximate equality of dress, which places a limit upon the demand for luxury goods at a point lower than that which prosperity might justify.

France's problem of readjustment, in short, is precisely the reverse of Germany's. Germany, with indemnity obligations to meet and with less easy access to material resources, but left with her finishing industries intact, should turn to the production of high quality goods for export in order to realize the highest value for the least consumption of raw materials and to keep all her labor fully employed on the materials being used. France, now endowed with material resources beyond the requirements for her marketable luxury articles, and with a diminished labor supply, should adjust her industrial organization to economize labor relative to materials, that is, adopt capitalistic production, and consequently turn out medium grade goods instead of fine quality articles.

This is in many respects the situation in which Germany found herself fifty years ago. Moreover, in Germany the same general patriotic enthusiasm existed, accompanying the victorious conclusion of a war. Germany had an autocratic government, but France's highly centralized paternalistic system may be capable of almost equal results, if she can maintain continuity of purpose. And France is not hampered by sectional jealousies such as exist at first in any confederation of states. France is not an agglomeration, but an entity.

Sarre Coal the Determining Factor

Upon closer inspection, however, certain important differences appear between Germany of 1872 and France of 1922. The most vital relates to coal. Of the acquisitions which France obtained by the Peace Treaty, that of the Sarre coal should be placed first. The addition of blast furnaces and steel works, or the increase in number of spindles and looms in the textile industry, signifies little without the motor power to drive them. While Lorraine iron was the foundation of Germany's ascendancy, it was her Westphalian coal that made that rise possible. Even before the War, France's iron reserves were 50% greater than Germany's; French Lorraine contains 75% more iron than Lorraine Annexée. But France's expansion was prevented by lack of coal; the same factor might prevent the effective employment now of her new productive capacity.

The first contrast that strikes one in comparing the Sarre coal field with the Westphalian is the distance from tidewater. The German coal is only about a hundred miles from ocean ports and is served by an excellent canal system. The Sarre field is at least twice as far. Industries established in the Westphalian district can obtain imported raw materials much more easily, and can export their finished products to overseas markets.

The Sarre deposits are less than a quarter as extensive as the Westphalian — 16 billion tons as compared with 53 billion, 10 billion tons at a depth of less than 3500 feet, comparable to the Westphalian beds now being exploited. The output of Sarre mines in 1913 was only a seventh that of Westphalian, or 17 million tons as compared with 114 million. And of the 17 million, over half was consumed locally, leaving 8 million available for French industry. This was little more than a third of France's normal imports of coal (including the equivalent of the coke she imported).

Westphalian coal, superior in quality to Sarre coal, runs 5 to 10% lower in price. Alsatian industries used to find it as advantageous to buy Westphalian coal, over two hundred and fifty miles distant, as Sarre coal eighty-five miles away — consumption of the one was almost equal to consumption of the other. For iron smelting in particular, Sarre coal is about 67% efficient. In the huge blast furnaces used in iron smelting, tons and tons of ore are poured directly upon the fuel. Ordinary coal would be pulverized under such a crushing load. It would be impossible to drive the blast through, or the fuel would be blown away as dust. Coke, and only special kinds of coke, has sufficient physical strength. Sarre coke can be used effectively in blast furnaces only by mixing it with at least 20% of Westphalian or equally good coke. Only 4 billion tons of the Sarre reserves at less than 3500 feet, moreover, are suitable for coking (compare Westphalia, 35 billion tons of coking coal).

Has France's economic situation, after all, been materially affected by her acquisition of Sarre coal reserves? To answer this question we may confine our attention at first to the consideration of the iron and steel industry: (1) because the inferior quality of Sarre coal refers to its properties for coking (the coal is not unsuited for other industrial uses, steam and gas), (2) because the steel industry is the one industry in which France is now most nearly independent, most richly endowed with raw materials, and (3) because iron is the foundation of national prosperity and power.

Let us also set aside for the moment the proposal of economists that France and Germany should return to their pre-war arrangement: that France should ship her ore to Westphalian and Rhineland furnaces, and receive as payment of the indemnity finished steel products for reconstruction purposes. We may grant that "France's cheap ore and Germany's cheap coal and unimpaired industrial equipment could be utilized thus with the least possible economic waste," that "any restrictions on either side must result in reduced industrial activity and diminished competitive power in the steel markets of the world." But that France could be willing to assist in the continuance of Germany's great industrial expansion and the permanent stagnation of her own industries, seems too unreasonable. The strength of a nation today is founded upon steel manufacturing — not upon iron mining, but upon steel ships, railways, machines, guns. While England's foreign trade is largely composed of textiles, iron and steel built her Empire. The decline of her steel industry may become a factor in the decline of her supremacy. For France, "for the economic good of the world at large," to surrender any opportunity to develop her steel-finishing industries would be to compromise her future prosperity, power, and safety. The economist and the statesman may look at the matter from different angles — but the statesman is in control.

Moreover, the economist's argument slights certain technical aspects of the situation. It is often pointed out that "Ore seeks the coal," that nearly all the world's iron smelting is done in or near districts where coking coal is available. Thus Sweden and Spain, with excellent iron resources but poor in coal, export their ores to Great Britain and Germany. Nevertheless, it is the peculiarity of minette ores that, owing to their low metallic content, they cannot stand the cost of transportation. Blast furnaces for smelting minette ores must be located near the iron mines. Even when Lorraine was part of Germany, and the great vertical industrial combinations owned coal mines in Westphalia and iron mines in Lorraine, it was the practice to smelt over half the ores locally. Out of 21 million tons of ore mined in 1913, 11.76 million were reduced to pig iron in Lorraine furnaces. Only

2.9 million tons were shipped to Westphalia. Most of the balance went to Luxemburg (2.9 million) and the Sarre district (2.8 million), both adjacent to the mining region. The blast furnaces in Westphalia obtained their ores chiefly from Sweden and Spain.

Finally, it must be noted that Sarre coke *can be used* for smelting, in proportions of four to one of Westphalian grade. An iron smelting industry as great as Germany's at the height of her power (1913) — which consumed 19 million tons of coke to produce 17 million tons of pig iron — would thus require 4 million tons of Westphalian grade and 20 million tons of Sarre coke (equivalent to 25 million tons of coal). That is, France would have to look to foreign sources for only 4 million tons of coke or 5 million of good coking coal.

Before the War, French industries consumed about seven million tons of coke, of which 41% was imported mostly from Germany. Her domestic product was obtained chiefly from her Valenciennes coal. A small quantity, 547,000 tons, was imported from Belgium. Belgium, however, has not been able to keep pace with her own requirements, and two fifths of the coal she used for the manufacture of coke was imported. The export balance of coke which she had maintained for some years disappeared by 1913. In 1901 a new coal supply, the Campine basin, was discovered. It is estimated that there are about 4 billion tons above a depth of 3000 feet and 8 billion above 4500 feet, consisting chiefly of long flame and good coking coal. Mine shafts have been sunk and some coal raised. The overlying barren strata, however, are water-soaked, and will make the development of the measures difficult and costly.

Great Britain supplied about half of France's imports of coal, 11.26 million tons out of 19.80 million. How much of this may have been coking coal of Westphalian quality is not determined. If Great Britain should lose France as a customer, her best customer, for ordinary steam coals, through

France's opportunity to use Sarre coal for general industrial consumption, the chance to offer coking coal, or better yet, coke, would probably be welcomed by British mine owners. In this connection, also, we may recall the recent agitation in Great Britain for the recovery and utilization of by-products of the coking industry. To this end, the French market for coke would create a broader basis for the British chemical industry. Before the War Great Britain used to produce about 20 million tons of coke; Germany, 25 to 30 million tons. French requirements for coke would thus raise England's production nearly to an equality with Germany's pre-war standing. At the same time, the competition from Great Britain might overcome German reluctance to supply the French market for fear of weakening her own chemical industry. With competition of sellers, France should find herself in a favorable position as a buyer.

At the present moment, France has occupied the Ruhr as a step to insure indemnity payment. It seems unlikely that the French will allow themselves to be dislodged without an absolute certainty, more reliable than "scraps of paper," of actual fulfillment of the treaty contract. This might be effected by a transfer to France of ownership and operation of mines. According to the original terms of the treaty, deliveries were to extend over a period of only ten years: seven million tons per annum for ten years, twenty million tons maximum for five years, and eight million tons maximum for five years, the various quantities being determined in relation to other sections of the treaty. Thus unless France should be able to obtain permanent ownership of some of the Ruhr mines, as in the Sarre district, the relief afforded will be only temporary — sufficient, however, to tide over the readjustment period.

The total known iron deposits of the Lorraine basin have been estimated at 1.55 billion tons (Fe content). At the ratio of 25 tons of Sarre coal for every 17 tons of pig iron produced, or 1 of pig to 1.47 of coal, the entire minette reserves could be smelted with 2.27 billion tons of coal. There would still be left a balance of 1.8 billion tons of coking coal and over 5 billion tons of ordinary coal, accessible at less than 3500 feet below the surface, for use in general industry. To carry abstract hypothesis further, the coal which Germany used for smelting in 1913 represented 15% of her total consumption. With an industrial organization like Germany's and a similar ratio for the uses of coal, France would consume, during the period in which she was smelting her Lorraine ores, a total of 14 billion tons of coal. Her entire reserves are estimated at 20 billions. At Germany's pre-war rate of consumption, these resources would last about a century, farther ahead than we need look. France and Germany may long before have settled their differences and found means for a more equal economic adjustment.

The coal reserves, moreover, will be supplemented by hydroelectric development. France's potential water power, 4.7 million h.p. at low water and double that at the average flow, exceeds that of any European industrial competitor. Norway, Hungary, and the region of the Caucasus alone are superior. Germany's potential power is estimated at 1.35 million; Great Britain's at only 900,000 or less. Of the other countries, Sweden has 4.5 million h.p., Spain 4.0, Italy 3.8, Austria 3.0, Switzerland 1.4. Most of France's water power is found along the eastern and southern borders, in the Alps, the Vosges, Jura, and Pyrenees mountains — well situated except the last, to supply her industrial centers with electricity. The powers in Alsace-Lorraine have high heads and there are numerous sites for storage reservoirs.

Extent and Location of France's Waterpower
(*At low water — power at the average flow is double the low-water figure*)

Northern Alps	1,000,000 h.p.
Southern Alps	1,300,000
Central Alps Vosges Jura	900,000
Pyrenees, etc.	1,500,000
Total	4,700,000

Conclusion

We may conclude, therefore, that France has at last obtained the basis for an industry whose factors, so far as production is concerned, are readily increasable — a situation she has hitherto never enjoyed. Figures of pre-war output no longer have significance. It may be recalled that Westphalian production was less than 10 million tons in 1870. During Germany's ascendancy, while both Westphalia and the Sarre mines were her property, she naturally exploited the better source, Westphalia. By change of ownership, the Sarre has ceased to be secondary. It is France's best source of supply; and mere possession has made it a determining and integral part in her industrial structure, an element which will justify extensive investments in mining and transportation facilities, adaptation of plants and equipment, modification of processes, etc. — impossible while dependence was placed upon foreign sources, even though the quantity available for import might be the same.

What effect the higher cost and remoteness from tidewater may have is impossible to estimate. So far as the distance of ore from coal is concerned, indeed, France is in a better position than Germany. Her disadvantage is confined to the shipment of finished goods, relatively small in bulk and for which freight is a less proportionate charge. The United States, it may be remembered, has a carriage of ore to coal averaging about 725 miles, and the finishing industries are

125 miles from tidewater. We make up for this handicap by economies of large-scale production. Our output of iron per man per year is 590 tons, to be compared with French and German (pre-war) 375 tons, and British 230 tons. Our blast furnaces have an output of 120,000 tons, in comparison with Germany's 55,000 and England's 28,000 tons. Identical economies are doubtless impossible in France, but the French are a people famous for originality of thought and invention. The nation that gave to the world the modern organization of the army may well be able to devise economies to meet her needs. The assumption that "the accepted genius of the French people" for quality goods and custom production is an immutable characteristic is fallacious.

Pre-war statistics of France's coal and iron consumption are no longer to be used as a basis for discussion. Germany, before the Franco-Prussian war, consumed about 25 million tons of coal and 1.4 million tons of pig iron (0.63 ton of coal per capita and 0.035 ton of iron). France in 1913 consumed 64 million tons of coal (1.62 per capita) and something over 4 million of iron (0.1 per capita). And for thirty years Germany's expansion, behind the protection of a tariff wall, was based chiefly upon a home market, which with its rapid growth was able to absorb the increasing output. German competition in foreign markets was scarcely felt before 1900. France has colonies. It is not generally appreciated that she is the second greatest colonial power in the world. Her possessions cover an area of 4 million square miles and have a population of 50 millions. They are capable of supplying nearly all the raw materials necessary for her industries. The most important, in northern Africa, are easily accessible — not scattered, like Great Britain's, to the ends of the earth. Hitherto France has been unable to develop them properly. Now she may be able to convert them from a liability into an asset.

From our brief survey of the economic history and post-war situation of France, we may conclude that she is indeed on the threshold of an industrial renaissance; that she has before her an opportunity to develop along capitalistic lines. It is probable, however, that her attention will be confined for several decades to come upon her internal and colonial markets. In foreign trade, France, Germany, and Great Britain will compete upon more equal terms, but at a higher level of quality than American manufactures; while we, with our plentiful resources, and our relative lack of labor shall doubtless continue to produce standardized medium grade goods. There will be little danger of direct competition between France and the United States.

CHAPTER V

ARGENTINA

The Pampas, ideal for stock raising and agriculture, are only partly developed. Argentina's slow progress at first was because of internal political turmoil and because the United States supplied Europe's food requirements. Drought, locusts, and latifundia still check agricultural population increase, and remoteness of mineral resources hinder industrial progress. Her one-sided development insures an excellent market for manufactures, but for European rather than American goods. Her products for exchange we do not need, except hides and skins and wool. Europe's requirements are greater than our own, and Europe has competitive advantages which reduce our prospects in Argentine trade.

Agricultural Resources

THE so-called Pampa (or Pampas, pl.) is the treasure chest of Argentina, the source of her wealth today, the basis of her future position among the nations of the world. This region is a level, grass-covered, practically treeless plain. It extends from the timber lands of Gran Chaco, north of the Rio Salado, to the arid wastes south of the Rio Negro, 800 to 1000 miles; and eastward from the foothills of the Andes to the coast, at its greatest breadth 635 miles. It comprises an area of two to three hundred thousand square miles, about the size of Texas or a quarter of Argentina herself. The eastern part of the Pampas is like our prairies of northern Iowa; the western, like those of Kansas. The whole region used to be the bed of a sea — the beaches are still evident where the water receded. Toward the west is shingle and sand, but eastward it has been covered over with silt brought down and deposited by the rivers that flow across the gentle slope from the Andes.

The Pampa is ideal for stock raising and for agriculture. Its climate is mild. The average summer temperature is about 75° F. In winter it rarely drops below freezing. Thus little or no care or expense is necessary for winter housing

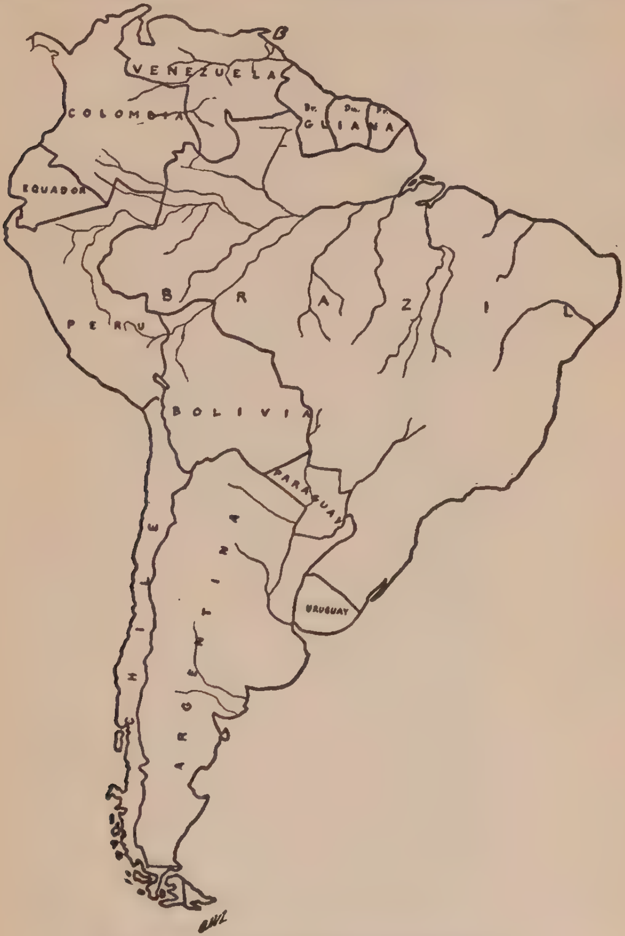

Fig. 14. The Nations of South America.

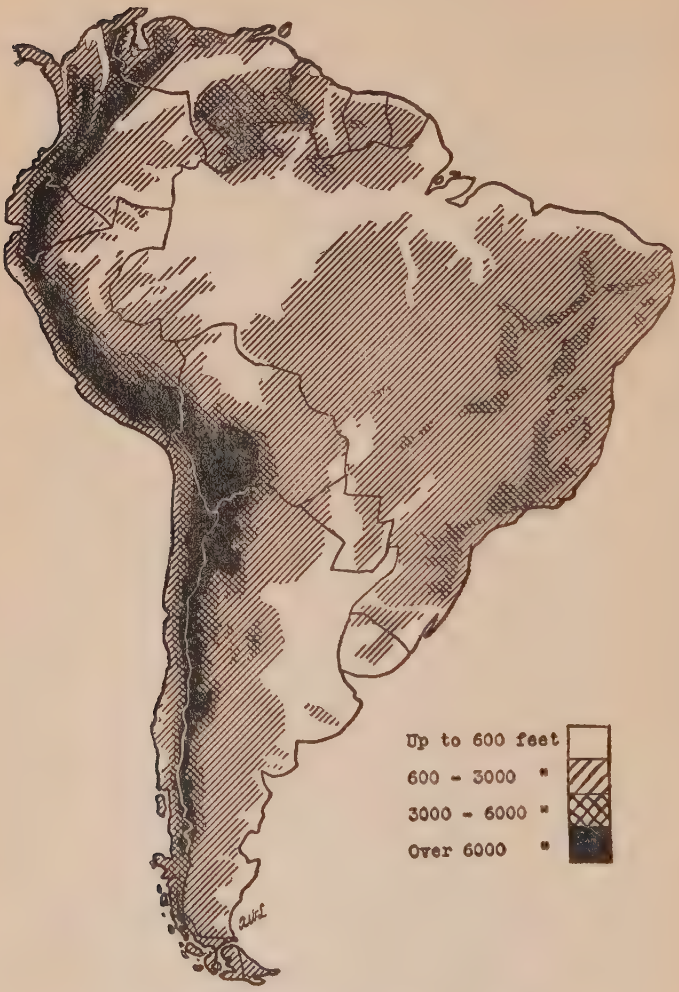

Fig. 15. Topography of South America.

of the cattle or for protecting the crops from frost. Before the Spaniards came in the 16th century, there were no cattle in South America. The few horses and cattle brought over by early settlers, however, escaped and ran wild when the Indians attacked and destroyed the first colonies. Two centuries later the animals had multiplied to countless thousands. "Any person may catch as many [horses] as he likes, and make them his own property — some horsemen, within a few days, bring home more than a thousand horses from the plain," wrote a missionary in 1822. The cattle were so numerous that "travelers were obliged to send horsemen before them to clear the way." To enlarge one's estate, it was simply necessary to hire additional "gauchos" for a few weeks to drive in eight or ten thousand cows and bulls. They were worth only as much as the labor of catching them — about five groschen or twenty-five to fifty cents (a reale de plate) for a full-grown ox.

It was unfortunate that lack of transportation facilities confined the commercially valuable products of the animal to the non-perishable parts, the hide and tallow. The slaughter of the vast herds, like that of our American bison, was retarded only by the task of stripping off the hides; the carcasses were left to feed the vultures. That such destruction in Argentina could continue unabated for a whole century is sufficient evidence, with the early accounts of the multiplication of the herds, to show that the pampa is capable of supporting millions of head, especially if some care is expended in breeding and raising.

Under natural conditions tussocks of tall coarse grass six or seven feet high grow over the pampas, but the soil is suitable for alfalfa or lucerne and grain crops. How amazed a New England farmer would be to find he could drive his plow mile upon mile in a straight line without once striking a stone or pebble! The soil is rich in plant food — a high percentage of potash, phosphoric acid in somewhat less proportion, nitrogen often abundant, and lime in small quantities in the best soils. In some parts of the pampas one can reap abundant harvests of the same crop for twenty years in succession without rotation or the use of fertilizers, or even leaving the land fallow for a while. In the northern section two crops a year are often gathered.

In 1870, Argentina exported twenty-one tons of wheat. Today she is one of the four great wheat-exporting countries of the world. Her shipments sometimes exceed those of the United States or of Canada. A record was reached in 1920 with something over four million tons. Her exports of corn (1920) have almost reached our own record of five million tons (1900), and may be compared with our average annual exports for the decade 1910 to 1920 of one million tons. She is the fourth or fifth country in the world in cattle raising (30 million head) and follows Australia with 45 million head of sheep.

Prospects of Future Development

With all this, less than a quarter of her tillable land is actually under cultivation and more than half of her live stock is still concentrated in three provinces, Buenos Aires, Entre Rios, and Corrientes. Most of her development has occurred, of course, in the provinces having easiest access to the ocean. Entre Rios and Corrientes lie between the two great rivers, the Parana and the Uruguay. Both of these are navigable by large steamers for a hundred miles or more from their junction with the River Plate. Smaller vessels can reach the port of Parana, two hundred miles up the Parana River, and Salto on the Uruguay. There are twenty-five to thirty river ports which load steamers from abroad. Indeed, it is possible in some places to moor the vessels to the banks, which form almost vertical walls, and run the cargo into the hold down inclined gangways. Almost half Argentina's overseas trade is handled by these upper river ports. The remainder is carried on chiefly by two ports, Buenos Aires and La Plata, on the River Plate.

The province of Buenos Aires is not so well provided with navigable waterways as Entre Rios and Corrientes, but the flatness of the country has made railroad building comparatively cheap. A railroad may run two hundred and fifty miles in a straight line with never a cut or a tunnel. Today, the province has 8.2 miles of railroad for every hundred square miles of area — about the same as Washington State or Nebraska. Cordoba and Santa Fe each have about 6.5 miles per hundred square miles (cp. Texas, 6.13 mi.). The total railway mileage amounts to about 22,000, or 2 per 100 square miles of area. Probably the greatest development in the near future will be in the southern part of the Pampas, in the territory of La Pampa, a region served by the port of Bahia Blanca, hitherto of secondary

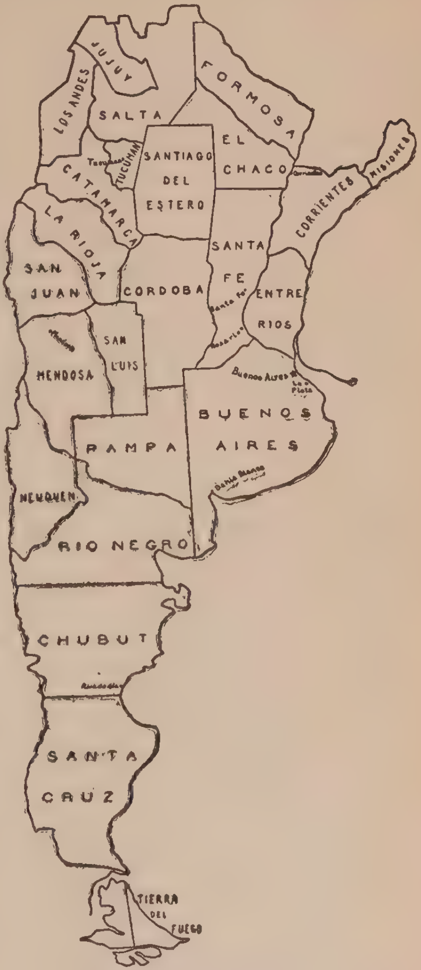

Fig. 16. Argentina.

importance. It can be only a matter of a few years before the entire pampas are served by an adequate network of lines.

It may seem surprising that, with such rich resources, Argentina should have been so tardy in her material progress as compared with the United States, which was not colonized until a hundred years later. Her present population of 8.5 millions is less than that of the United States in 1820. Yet, with only a fifth to a quarter of her agricultural area developed so far, she might well support 35 to 40 million inhabitants without any increase in the present average density, but simply by putting under cultivation her virgin lands. Forty per cent of her inhabitants are at present concentrated in cities of over 10,000 persons, so that the average density outside the cities is very low, under five persons per square mile. In the province of Buenos Aires the rural density is 8.6; in Cordoba, the greatest wheat-raising province, 9 persons per square mile. Kansas, our own greatest wheat state, has a rural population density of 14 per square mile. If the density of the rural* population of Argentina were to increase until equal to that of comparable states in this country, her total population could reach over fifty millions.

But until comparatively recently Argentina has been handicapped by adverse political conditions. Before the 19th century, she was under the repressive, short-sighted rule of Spain. When Napoleon invaded Spain, and it seemed only a matter of weeks or months before he would seize the Spanish American colonies, the provinces of the Rio de la Plata hastened to declare their independence. The course of the new Republic, however, was stormy. More time has been devoted to revolutions and wars than to farming. Fifty years ago the total population was still under two millions. Immigration was practically nil.

Although Europe has been importing food since the industrial revolution, the United States has easily been able to meet her requirements until the last quarter of the century just past. It has only been the declining surplus available for export abcve our own needs, that has forced Europe, with her continually growing dependence for food, to turn to Argentina and has thus brought about Argentina's rapid development during the last fifty years.

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* Outside of towns of 2500 inhabitants.

The pressure of industrial populations upon the world's agricultural resources seems little likely to abate during the present century. The resources of Russia may again be thrown open to feed western Europe, but exports from the United States will decline. The Argentine farmer, moreover, is far more progressive than the Russian peasant, and the latter will find it difficult to recover from his lengthy and disastrous debauch of the past few years under Sovietism. Argentina's future development as an agricultural country is well assured.

Nevertheless, Argentina is not without certain handicaps, even as an agricultural country, which may hinder the growth that she might otherwise enjoy. Though the extension of irrigation in those parts of the country where water is most needed is reducing the danger, droughts occasionally ruin crops and decimate the herds. The farmer may not have frosts to contend with, but he has the locust. Every few years tremendous swarms, as in the Bible stories of Egypt, sweep down from Gran Chaco in the north and devour everything before them. Swarm succeeds swarm for many days in succession, dimming the sun by their numbers and actually stopping railroad trains. After they have passed, no green thing, not the tiniest wisp of grass, is in sight.

The greatest obstacle to a rapid increase of rural population is the evil of "latifundia": the possession by a single man or corporation of vast tracts of land, sometimes over two hundred* square miles in extent! Unlike the system adopted in the United States, land in Argentina was given away in great blocks to political favorites and warriors, so that now it is very difficult for the immigrant to obtain a holding. This is probably the chief reason why every year more than half of the immigrants that reach her shores turn back again without settling permanently. At best the small farmer is forced to become a tenant, and tenant farming is not only unsatisfactory to the occupant but is notoriously unprogressive, wasteful, and undependable. Fortunately latifundia is said to be gradually diminishing through the splitting up of large estancias by inheritance. The tendency for agriculture to displace stock raising, moreover, tends toward rural population growth, for agriculture demands greater intelligence and foresight than stock raising, and more workers per acre, and promotes greater subdivision of land, the development of villages, railroad extension, and immigration.

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* In western provinces there are ranches over twelve and fifteen hundred square miles in extent.

It is very doubtful, however, whether Argentina's progress, even with her present stable government, with the food markets of Europe to supply, and diminishing obstacles to agricultural development, can approach that of the United States during the last century. Argentina's mineral deposits are located in the remotest corners of the Republic, practically inaccessible on account of the long rail haul to the coast. Scarcity of water and lack of fuel have prevented mining — or even a careful survey of mineral resources.

With the exception of industries concerned with the reduction of raw products to the smallest bulk for shipment, such as flour mills, meat-packing establishments, dairies and cheese factories, tannin extractive plants, etc., it is improbable that manufacturing will attract capital or flourish on a large scale. It will be cheaper to import finished articles, paying with agricultural products, than to pay high prices for industrial labor, and high transportation charges for fuel and raw materials. Argentina promises to remain essentially an agricultural country, and as such her population increase will not attain such rapidity of growth as that of one better suited for industrial development.

Argentina as a Market for American Manufactures

While her population may not increase as rapidly as one might expect, the very fact of her one-sided development as a purely agricultural nation will make her an extremely favorable market for manufactures. Population numbers have much less significance with regard to the extent of a market for manufactures than for food products. Although the requirements for any specific article may be directly proportionate to the population, the demand for manufactures in general is far more elastic, is limited only by the purchasing power of the customer. So long as Argentina's food products are needed by industrial countries (and 80% of her agricultural production today is for export), she will be able to absorb their manufactures to the extent of her purchasing power.

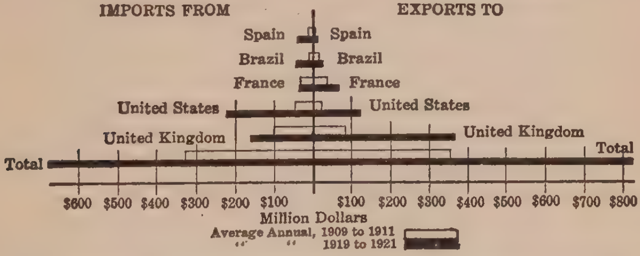

FIG. 17. Foreign Trade of Argentina, Annual Average, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

But although Argentina holds out such excellent prospects as a market for manufactures, does it follow that it is destined for American trade? Argentina's relations before the War were with Europe rather than with the United States. We furnished less than a sixth of her imports and used to receive only five to eight per cent of her exports. This indeed was a pretty large share, if we consider the extent of our investments in Argentina, for trade and investment usually go hand in hand. Railways, for instance, purchase their supplies and equipment from the country where the board of directors is located. Three quarters of the stock of Argentine railways was held by British capitalists; the boards of directors were in London. Of the four to four and a half billion dollars invested by foreign countries in Argentine enterprises, the United States had contributed only about 2 to 2½%. Great Britain's investments were estimated at a little less than two billion dollars, or twenty times as much as ours; France's at about $400 millions, and Germany's at $250 millions.

The War gave our trade an extraordinary advantage. Our exports to Argentina increased from $50 million at the beginning of the decade to $211 million at the end, from 13.7% of her total imports to 33%. Our exports to Argentina of bleached cotton cloths increased in the average annual yardage exported during the period 1919/21 seventy-one times over that of 1909/11; colored cotton cloths, 100 times, or 10,000 per cent! This expansion in our trade with Argentina has occasioned undue optimism among American manufacturers and exporters. It behooves us to ask whether our ascendancy is a permanent development or simply a temporary advantage gained by Europe's disability resulting from the War. But to answer this we must first ask, "What has Argentina to offer us in exchange?"

Her Commodities for Exchange

Six commodities compose 80 to 85% of Argentina's exports: wheat, corn, linseed, and the livestock products of meat, wool, and hides and skins. The United States herself is an exporter of all of these. We are foremost in the world in wheat production, growing 20% of the world's total yield; first by millions of bushels in corn production, with over two thirds of the world total. We produce a fifth of the world's linseed. We have over twice as many head of cattle as Argentina. We are the fourth country in sheep raising. Apparently there is nothing important that Argentina can offer that we do not have ourselves. Three-cornered trade offers no solution. Argentina has nothing to sell Brazil, for instance, that Brazil cannot produce herself; and payment by way of Europe would mean increased exports from Europe to the United States, directly contrary to the actual trend of trade.

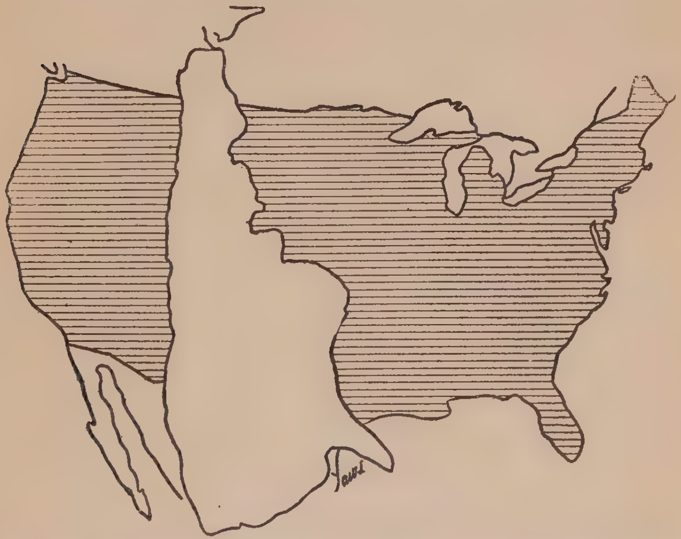

FIG. 18. Climatic Similarity of Argentina and the United States. (Shown by inverting Argentina upon the United States with corresponding latitudes, north and south, coinciding.)

Nevertheless, before dismissing the question, it may be well to consider certain possibilities of the future. While it is doubtful whether the United States will ever require

Argentine grain in any quantity, the return of Russia, coupled with a decline in Europe's purchasing power, may put a check upon Argentina's development in this direction and encourage, relatively at least, expansion in other lines of greater interest to us.

Although the United States at present is self-sufficing in meat supply, the time may come when we shall begin to import. A cattle-raising country passes through four distinct stages: (*a*) at first, when land is free and markets are far distant, cattle are raised on open ranges, sixty acres or so to a steer. The animals are branded to distinguish their possession. The products are hides and tallow, nonperishable and capable of being transported by crude conveyances over long distances. (*b*) As land grows less cheap, properties are fenced in. Ranches take the place of ranges. Meat becomes a commercial product in addition to hides and tallow, because railroads have been extended within reach and markets have become more accessible. (*c*) The third stage is the balanced farm, where part of the land is used for grains and more concentrated feeds for the cattle, and the livestock gives fertilizer for the crops. At this point it begins to become worth while to import part of the cattle feeds, such as oil cake, and use the land for the more valuable crops for human consumption. Certain sections of the United States have reached this stage, and import linseed and oil cake. (*d*) In densely populated communities, as in western Europe, cattle are still raised — no longer for their meat, but for dairy products. The meat is imported from countries still in the second stage.

The reason for this economic development may be found in the relative amount of food value obtainable from a given area of land. As land grows dearer, of course, it becomes imperative to secure the greatest possible support for human life from every unit. Comparative figures of the food value of various products from a given area of land have been compiled by the Department of Agriculture which bring out the point most clearly: *

Relative Food Value per Acre of Certain Commodities, Compared with Corn as a Base, 100%

Corn	100%
Potatoes	91
Wheat	57
Peanuts	40
Oats	40
Milk	23
Pork	22
Mutton	4.3
Beef	4

Cattle yield valuable fertilizer for crops. Where land is scarce they continue to be raised, also, for their milk, which has nearly six times as much food value as the beef. Sheep, which yield no food of higher value than their meat, are usually crowded out entirely by the advance of population.

As the United States becomes more and more an industrial nation, it will prove economical to use a greater proportion of our corn for direct human consumption and less for cattle feed, and to import more meat and cattle feeds. But this change will be gradual. Today four fifths of our enormous grain production of 5.2 billion bushels is used for livestock. We consume directly and export some 900 million. We still use 55 million acres for hay, and leave as pasture a fifth of our productive area, 175 millions of acres which can be used for more concentrated feeds when needed. Nevertheless, the trend has already begun to show in certain sections of the country, and was brought into greater evidence by the War. During the last decade we have begun to import linseed; in 1920 we purchased 25 million bushels (23 million from Argentina), worth $75 million. If European competition in the buying market for meats is checked appreciably, we may import from Argentina somewhat sooner than might be expected.

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* Or we may explain the matter in another way: An ox consumes approximately as much as five men. It is slaughtered, say, at the end of two years — after it has consumed 5 × 2 × 365, or 3650 days' food for one man. Dressed, the ox produces 750 pounds of meat. This at five pounds a day (the ration of the South American cowboy, who lives almost entirely on meat) would be $\frac{750}{5}$ or 150 days' rations for one man. That is, the same amount of land supports a man on a meat diet for only $\frac{150}{3650}$ or about $\frac{1}{25}$ of the time it would on a cereal diet. Twenty-five vegetarians could live where only one meat eater could. (From "The World's Food Resources" by J. R. Smith.)

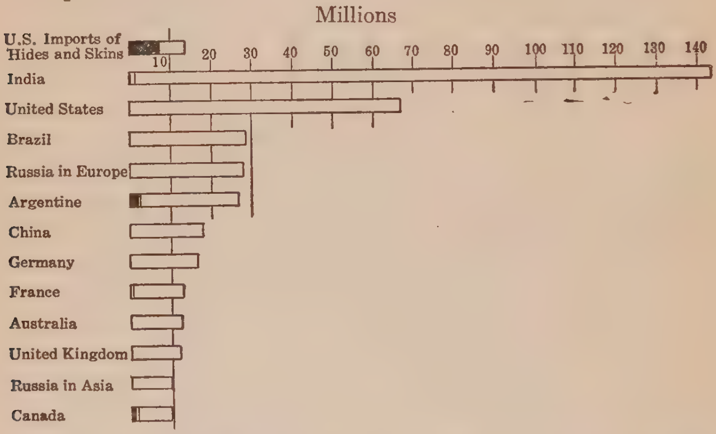

FIG. 19. Cattle-raising Countries of the World, and United States Imports of Hides and Skins.

(Showing the number of head in each country, and United States imports of hides (pieces), average annual 1919/21, in black, and imports of calfskins (pieces), by single line.)

More immediate and definite are the prospects for wool, hides, and skins. In the United States, these have become by-products of the meat industry. As we turn more and more to dairying, and slaughter fewer cattle for meat, we shall have, *ipso facto*, fewer cattle hides and calf skins of domestic production and must purchase from less developed countries. Over the two decades for which we have classified figures, however, such a trend for cattle hides, at least, has not yet appeared. The great increase in imports of hides during the decade beginning with 1910 was due rather to the War demand and the removal of the tariff. Violent fluctuations within each period obscure any possible development:

United States Imports of Cattle Hides

Years	Quantity (Mil. Lb.)	Variation Above or Below Average	
	Dutiable		
Average	135		
1900	164		+ 29
1901	129	− 6	
1902	149		+ 14
1903	132	− 3	
1904	85	− 50	
1905	113	− 22	
1906	156		+ 21
1907	135		
1908	98	− 37	
1909	192		+ 57
	Free		
Average	310		
1910	318		+ 8
1911	171	− 139	
1912	304	− 6	
1913	224	− 86	
1914	308	− 2	
1915	409		+ 99
1916	404		+ 94
1917	371		+ 51
1918	221	− 89	
1919	407		+ 97
1920	275	− 35	

Our imports of wool also fluctuate widely, but exhibit a more definite increase:

United States Imports of Clothing Wool

Years	Quantity (Mil. Lb.)	Average for Period	Proportion from Argentina and Uruguay	Proportion from Australia and New Zealand
Dutiable 1900	37	37	28%	30%
“ 1901	31	59	10	35
“ 1902	66		52	19
“ 1903	42		29	33
“ 1904	46		35	24
“ 1905	110		35	24
“ 1906	87	94	39	26
“ 1907	83		25	43
“ 1908	46		28	36
“ 1909	143		32	25
“ 1910	112		28	37
“ 1911	40	105	35	27
“ 1912	71		34	22
“ 1913	67		38	18
Free 1914	125		31	23
“ 1915	222		32	30
“ 1916	403	320	30	43
“ 1917	279		79	4
“ 1918	374		59	19
“ 1919	334		50	18
“ 1920	212		48	18
“ 1921	208	208	47	24

Sheep raising in the United States is already practically stationary — decreasing relatively to population growth and to our requirements for wool and mutton. Forty years ago we had as many sheep as we have today. We have declined from a maximum reached in 1903, when we had 64 million head or over 50% more than we have now. Already we purchase from abroad as much wool as we obtain from our domestic flocks.

Sheep raising in Argentina is undergoing a twofold development. In the regions of the River Plate, where already the mutton has become of greater value than the wool, the industry is being crowded out by the encroachments of agriculture. In Patagonia, south of the Rio Negro, on the other hand, it is expanding rapidly. Far down in the bleak, wet regions of Tierra del Fuego sheep have been introduced from the Falkland Islands. This is still frontier country where most of the land belongs to the squatter who occupies it, and is exploited for immediate profit without regard to conservation for the future. The persistence of the native pasture in spite of careless ranging and continued close cropping shows that it is well suited to the industry, and the unfitness of the climate and soil for agriculture makes probable the ultimate and permanent concentration of sheep raising here rather than on the pampas.

While our requirements for Argentine products will increase as our industrial development outgrows our agricultural resources, it must be remembered that Europe is already further advanced in this direction than we are. Her industrial population has already outrun her means of subsistence. She needs Argentina's products more than we do. The United Kingdom took 37% of Argentina's grain before the War, and Germany 23%. American packers have become a real factor in the meat business in Argentina, but their capital investment amounts to only a seventh of the total invested in Argentine meat-packing enterprise, and Europe normally (1914) takes 85% of the meat exported. We do import wool, cattle hides, and flaxseed. Indeed these comprise about 75% of our imports from Argentina. Of all three commodities, however, Europe's need is as great as our own. Before the War (1914) we took 60% of Argentina's cattle hides, but only 15% of her wool exports and a small fraction of her exports of linseed.

America's Advantages and Disadvantages in the Argentine Market

The only remaining consideration is the question of relative purchasing power. In ultimate analysis Argentina will doubtless supply whichever customer can and is willing to pay her most, *i.e.* give her the greatest value in the form of consumable commodities suited to her needs. In some lines of manufacture, the United States has a practical monopoly of production. Conditions for the use of high-grade agricultural machinery are practically identical in Argentina with those of our prairie states. Our manufactures can doubtless permanently excel European manufactures, whose home market does not call for these types of machines. Not all goods in which we feel we have a decided competitive advantage will necessarily find a market, however. Argentina is the richest country, per capita, in the world. The people are of south European character, not of the somber, thrifty Teutonic or Anglo-Saxon races. The Argentine cares less for price than for attractiveness of design and novelty, quality and general purchase-tempting appearance. He buys the best and the best only. He dresses according to Parisian and London styles, the very latest — even to furs in December, Argentina's midsummer. His taste runs to adornment. All this tends to give Europe's luxury goods an advantage over our medium grades. Furthermore, some articles in which we have an unquestioned advantage are not adapted to the needs of the country. The soil of Argentina is so light, and gravel and rock for road building are so expensive to transport, that the good-roads movement fails to obtain very great success. It is doubtful whether outside of the cities Argentina will be as good a market for automobiles as her wealth and prosperity might lead us to expect.

And finally, Europe's heavy investments in Argentina, already noted (page 124), establish a bond of interest with which it will be difficult to compete. Although Argentina holds out great promise of future development, owing to her rich agricultural resources and to the increasing pressure of industrial populations upon their domestic means of subsistence, and although our own requirements for Argentine products will undoubtedly increase gradually with our progress as a manufacturing nation, Europe's requirements are greater than ours, her trade connections are established upon a sound basis of exchange, and finally, many of Europe's manufactures are really better suited than our own for the Argentine market.

We must not turn our backs upon Argentina, of course. In such a rich market there will be room for all competitors. But we must avoid any such extreme optimism as that which took possession of us in the decade covering the War period. Argentina will be a highly competitive field. Exchange rates will probably run against the United States, and personal relations between traders will be closer with Europe than with this country. Before entering the Argentine market it will behoove the manufacturer to study the field with special care to make sure that his particular article will find a sale in the face of these advantages and in competition with similar European manufactures. The American investor should take into account in his calculations that, although in making the investment he may gain by appreciation of the dollar, his interest or dividend payments may have to be returned over an adverse exchange.

CHAPTER VI

BRAZIL

Brazil is the economic supplement of the United States, — (1) *As a source of commodities we need:* Coffee, Rubber, and Cocoa are important and rapidly increasing imports into the United States. Brazil has ample room for expansion, her output being limited only by present lack of competent labor. Numerous other commodities are of interest to the United States, but others may afford trade relations with Europe. (2) *As a market for our manufactures:* Brazil's consuming population, though preponderantly of low standard, is large and habitually extravagant. Her economic development, affording a market for producers' goods, awaits railway extension. Construction, hitherto hindered by difficulties of topography, may be promoted by harnessing her enormous hydro-electric power. "Our share" of Brazil's import trade depends upon our own initiative. Our position is advantageous and conditions are favorable. Brazil offers a brilliant opportunity.

Brazil the Climatic Complement of the United States

WHILE we have been so assiduously promoting our export trade to Argentina, a market more or less temporary, whose products are not greatly needed by the United States, we have been neglecting Brazil. Here is a country producing not only the same commodities that Argentina produces, but many others which take the foremost place among our list of imports and which we shall need more and more in the future. Coffee and rubber, the chief exports from Brazil, hold third and fourth places among our imports. Sugar and silk, our primary imports, can be raised there (though it is doubtful whether we shall ever obtain any appreciable quantities from that source). Cocoa, all kinds of tropical fruits, valuable hard woods, and plants yielding gums, resins, and numerous drugs abound. In short, Brazil is the climatic complement of the United States, extending from 35° south latitude, which corresponds to Florida on this side of the

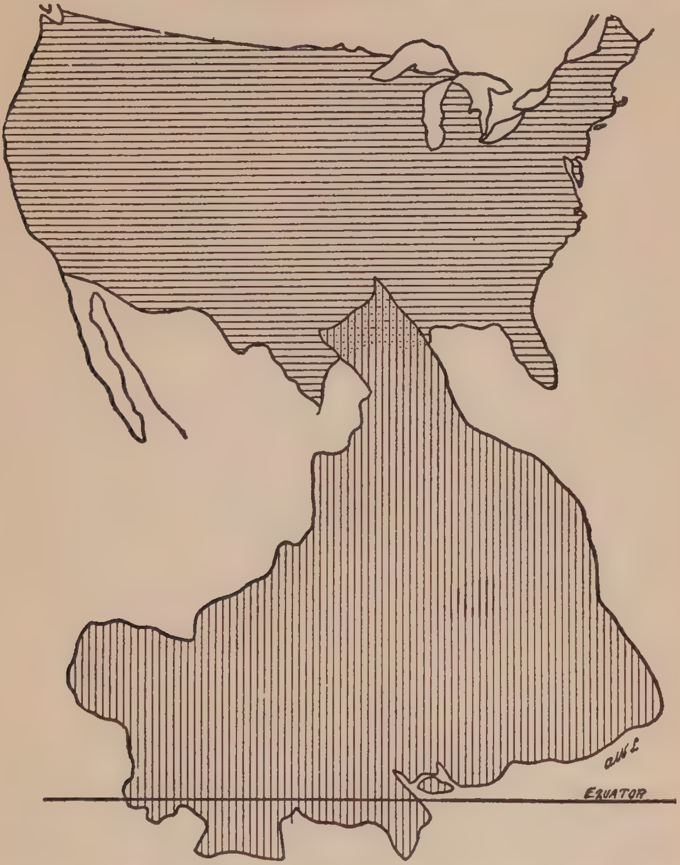

Fig. 20. Brazil, the Climatic Complement of the United States. (Shown by inverting Brazil, with the equator as an axis and corresponding latitudes, north and south, coinciding.)

equator, to 5° north latitude. Trade between countries differing merely in stage of industrial development is relatively temporary. We have noted the decline in the proportion of our trade with Great Britain. Trade between countries differing in customs and type of civilization, as between the Orient and western nations, must decline as differences are gradually wiped out through closer communication and exchange of ideas. Differences of climate, however, are permanent, and trade based upon climatic differences can never decline except through an absolute decline in supply or demand. Commodities that we cannot raise under our temperate climate can be produced in Brazil. As time goes on, we shall require more and more of Brazil's products, and in Brazil we shall find a ready and growing market for our manufactures.

Coffee

Coffee is Brazil's most important product, averaging about half her total exports during the decade ending 1920. Her coffee crop amounts to about 75 to 80% of the world's total production. Her maximum yield during the decade was a little over two billion pounds, or a million tons (1916). This was nearly ten times as much as the record of her closest competitor, Colombia, in the season of 1921/22.

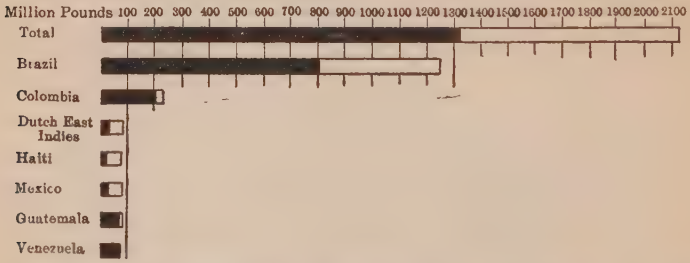

FIG. 21. Coffee-producing Countries of the World, and United States Coffee Imports.

(Showing the total output and the output of each country, average annual, 1919/21; and the portion imported by the United States, in black.)

The United States, the world's chief coffee-consuming country, is naturally Brazil's best customer. Our annual imports come to 1.3 billion pounds, two thirds of which we buy from Brazil. France is second to the United States as a coffee consumer, taking about three to four hundred million pounds, but only about half of this comes from Brazil.

Although coffee is really nothing but a luxury, without nourishment or food value, and used simply as a stimulant, most Americans have come to look upon it as a daily necessity. On the basis of adult population, we consume each year about seventeen pounds per capita. Our consumption is increasing more rapidly than our growth of population. Since 1855 it has multiplied seven times, while our population has increased less than four times. Imports trebled in quantity in thirty years from 1855 to 1885, and almost doubled during the next thirty years. In 1920 our purchases amounted in value to $250 million. Whatever other economies we may have practised during the War, coffee drinking does not appear to have been one of them. Nor does it seem likely that we shall require less in the future. With our steadily increasing population, Brazil may expect to market ever larger quantities in the United States.

And Brazil has ample room to supply us with all and more than we may require. She has only during the past century (since 1835) taken a place among the coffee-producing countries of the world — only just begun to cultivate it. The plant is indigenous in Africa and was used by the Ethiopians from prehistoric times. In 875 A.D. it had spread to Abyssinia. Thence it was carried to Arabia, to Java in 1690, to India 1700, and to Ceylon in 1720. It reached America through the French. Louis XIV had received a plant brought from Java by the Dutch of Amsterdam. It was introduced into Para from Cayenne, French Guiana, in about 1730, and was brought by a monk to Rio de Janeiro in 1774. Coffee houses had been opened in France and England during the latter half of the 17th century, but it was not until 1835 that the Brazilians, who had been growing it for use simply as a drug, learned that it was being drunk as a beverage in Europe and began to cultivate it extensively.

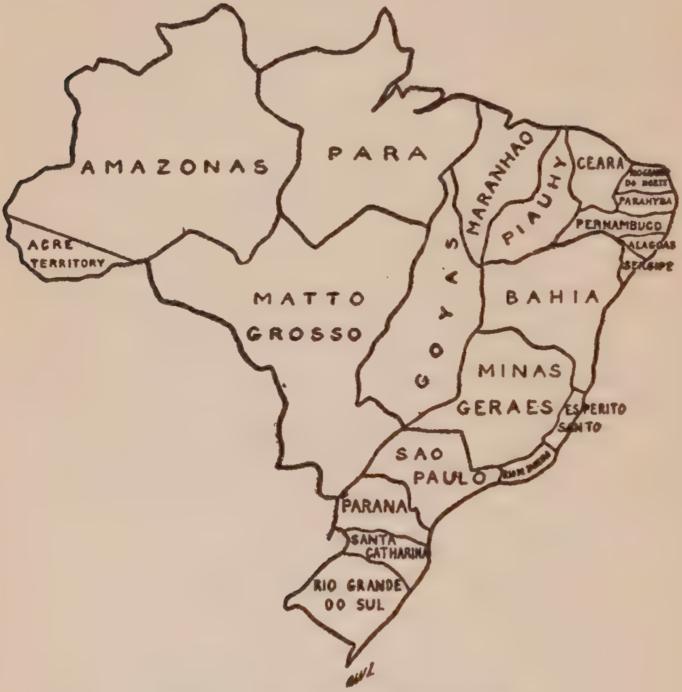

FIG. 22. The United States of Brazil.

Coffee production in Brazil is still confined to four states, São Paulo, Minas Geraes, Rio de Janeiro, and Espirito Santos, on a small area covering four and one half million acres (7000 square miles), lying immediately behind the coffee ports of Santos and Rio de Janeiro. The state of São Paulo alone produces three quarters of the entire output. Outside of this region thousands of square miles of land suitable for coffee growing, but as yet untouched, are available for future expansion.

The coffee shrub or tree (fifteen to eighteen feet high) thrives best in a hot, moist climate, with a rainfall of 75 to 120 inches, and in a soil at once well drained and rich. It can grow almost down to sea level, but prefers altitudes of about 2000 feet. It is not a hardy plant, and while it demands a tropical temperature, it must be protected from the direct heat of the sun's rays. Also the leaves, three or four inches long, are easily torn by the winds from the slender branches unless they are sufficiently protected. Most of the great plateau region sloping inland from the Coast Range toward the Parana River, as far northward as Pernambuco, meets the required conditions — an area capable of producing several times as much coffee as the whole world needs. The climate, of course, is warm; the southeast trade winds bring from the south Atlantic a rainfall of 80 inches or more; the hillsides, cut by erosion, give the necessary drainage; the soil, rich and red, is a decomposed lava mixed with decayed vegetable growths, a hundred and fifty feet deep — a thousand in some places; the altitude is from 600 to 2500 feet above sea level.

The only possible limitation to production is lack of a suitable labor supply. Coffee growing does not lend itself to careless and haphazard methods. Careful attention is required from the very planting of the seed. There is danger that the seedlings may die if they are set out in position at the first planting. They require plenty of water at this stage. Therefore it is the practice to start them in nurseries, where they can be given the closest care — water, shade, protection from the wind, etc. They are transplanted only when they have reached a height of one or two feet. In the spaces between the little trees — spaces of about ten or fifteen feet — corn, beans, or bananas are planted to give temporary shelter and a subsidiary source of income during the three or four years before the trees begin to bear. Constant weeding is essential where conditions are so favorable for luxuriant and rapid growth of vegetation.

No less attention is required from harvest to market. The fruit is much like our cherry, and indeed is so called. It grows in clusters, like the beautiful white flowers that precede it. The cherry is dark green at first, changing to yellow, then to red, and finally ripening to a dark crimson. Inside a fleshy pulp are the coffee beans, like the cherry stone or pip, but usually two in number. The bean has a husk or "parchment," and inside this a silver skin covering the bean itself. Preparation of the coffee for the market consists in extraction of the bean from these outer coverings.

The first step, of course, is to gather the fruit. In Arabia the cherries are allowed to ripen on the branch until they drop on to the cloths spread beneath to receive them. Brazil's coffee is generally inferior to the best grades, for the cherries are shaken from the trees or even picked by hand, so that much unripe fruit is taken with the ripe.

In order to divest the bean of its coverings two methods are used. The fruit may be dried for two or three weeks, the outer part being broken away and the bean set free. More often the "wet" method is preferred, as being more speedy. The cherries are put into a tank of water to separate the well-developed ones, which sink to the bottom. They are next passed through a "pulper," a rough cylinder revolving against a curved plate, which crushes the cherries without breaking the seed. This pulp, still containing the seeds, is carried to another vat of water, which is constantly stirred. The seeds are thus loosened from the pulp and, being heavier than the water, sink to the bottom and are carried away for further treatment. To get rid of the parchment covering, the beans are allowed to lie from twelve to forty-eight hours until the parchment ferments and can be washed away or trampled off with bare feet. The silver

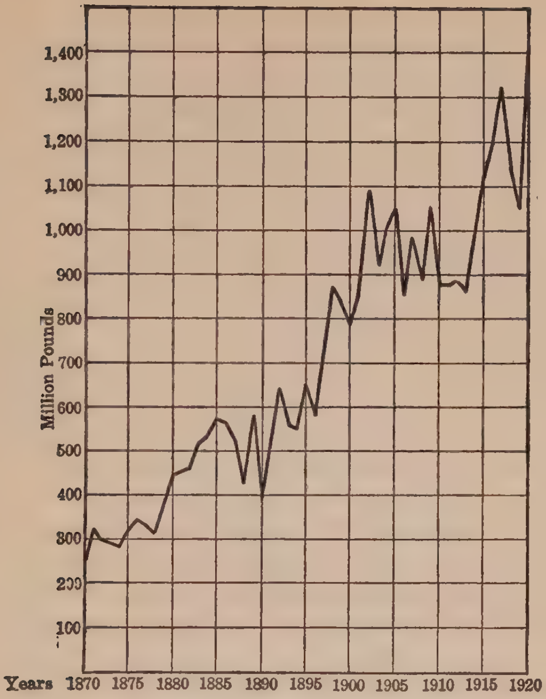

Fig. 23. Coffee Imports into the United States, 1870 to 1920.

skin is rubbed off after the beans have been dried in the sun or by steam heat. The dried "berries" are picked over to remove the discolored ones and to collect the "pea berries," which fetch a higher price, and are finally sized by being passed through sieves.

The coffee states of Brazil are endeavoring to solve their labor problem by encouraging immigration. They are exerting every effort to attract immigrants from Europe and even from the Far East. Free ocean passage is offered, and transportation to whatever destination is chosen by the immigrant; free accommodation there for the first few days is given, and equipment necessary to start with. Land and house are offered on long, easy credit terms. If need be, free maintenance is granted until the sale of produce after the immigrant's first harvest, free medical assistance, and elementary instruction for children. No religious qualifications or sectarian limitations are imposed. Property and personal rights are the same for immigrant as for Brazilian.

Although the proportion of immigration to the total population is much lower for Brazil than for Argentina, 8% as compared with Argentina's 30%, the actual numbers are about equal. Mediterranean Europe has contributed most. Hitherto about 35% have come from Italy, 33% from Portugal, 13% from Spain. Already the incompetent negroes, who were slaves until 1892, are being dismissed and the Italians are taking their places on the coffee estates. Brazil offers a more favorable opening for the small immigrant than does Argentina. The opportunity for acquiring land is much greater. It is probable that Brazil will benefit greatly by the unhappy economic situation of Europe, for immigration will assist her in the solution of her labor problem.

Rubber

Rubber is distinctly a twentieth century commodity. The aborigines, it is true, knew of its resilience and its waterproof quality before the discovery of America. Mention is made (1525) of the rubber balls, or "seringas," the Indians played with, and of their rubber shoes. In 1775 Priestley discovered that rubber would erase pencil marks, and this became its most important use in Europe. Hitherto it had been called "caoutchouc," from "caa," wood, and "o-chu," to weep or run, but from its use as an eraser, now one of its most insignificant uses, it acquired the name rubber — India(n) rubber, to make confusion of origin more complete. It was not until McIntosh discovered in 1823 that rubber was soluble in benzine and began the manufacture of water-

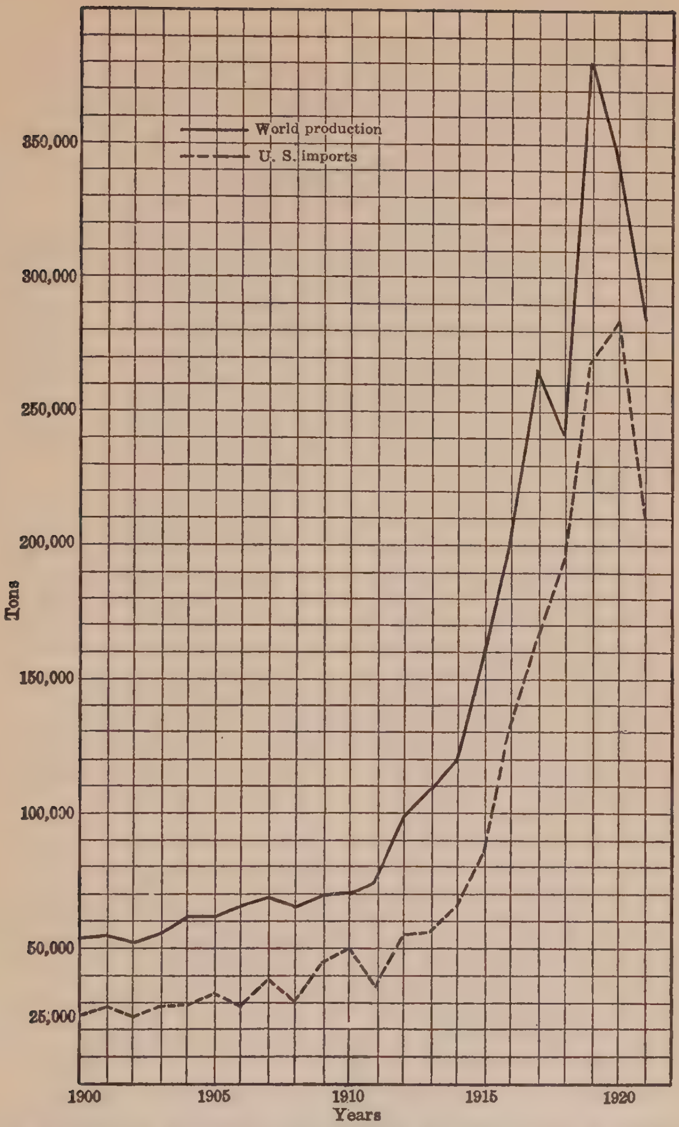

FIG. 24. World Production and United States Imports of Rubber, 1900 to 1921.

proofed coats, and Goodyear in 1839, after years of patient experimenting, invented vulcanizing with sulphur, that the possibilities of the material began to be realized. The twentieth century, however, with pneumatic tires for automobiles and countless other uses to which rubber is applied, has created the real demand for rubber. Until 1910 our imports increased regularly by about 50% per decade. The average annual requirements in the years 1919 to 1921 were six times as great as in the years 1909 to 1911, and followed closely in value our imports of coffee. The importance of rubber, however, has been gaining far more rapidly than that of coffee. We are today the greatest rubber-consuming country of the world. We take three eighths of the total world's production.

Although the Amazon valley is the original home of the rubber tree, less than a tenth of what we import comes at present from Brazil. Throughout almost the entire region drained by the Amazon and its tributaries, about 2.4 million square miles, the tree flourishes in natural state. Hundreds of millions of rubber trees are growing in the great states of Para, Amazonas, and Acre in Brazil, covering 1.25 million square miles, and in portions of Bolivia, Peru, Ecuador, Colombia, and Venezuela. There is a wealth of rubber that has scarcely been touched. Only a few miles from the river banks one may reach virgin forests.

Insufficient and incompetent labor, as in the case of her coffee, is the chief deterring factor of Brazil's rubber production — not any shortage of supply of the commodity. If she can solve her labor problem for rubber production, here is a second resource for which the United States, already the greatest market in the world, offers a demand of indefinite future proportions.

The entire region where the trees grow is low and swampy. Every year during the rainy season the rivers rise and inundate thousands of square miles for three or four months at a time — reminiscent of the time when all this region was one vast inland sea. The gradient, for hundreds of miles, is not over an inch in a mile. Iquitos, twenty-four hundred miles inland, is less than two hundred feet above sea level. Thus the enormous accumulation of rain water collected over the vast watershed during the rainy season is carried off very slowly. The jungle becomes a lake with tree tops as islands, the temporary home of alligators and water snakes. The impossibility of controlling these annual floods is, as we shall see, the most serious obstacle to a happy solution of Brazil's labor problem in connection with her rubber production.

In order to live in the Amazon rubber region throughout the year it is necessary to build the houses on poles. One is practically marooned in company with one's dog, fowls, and a host of insects, from March to May. There is no way of getting about except by boat. Obviously, few people are tempted to stay there through the year. The isolation is too severe. Those who do stay are said never to smile, and break down in a very few years. They return, if they ever do return, complete physical wrecks. It is preferable to travel back and forth over the two or three thousand miles between the habitable cities on the coast and the collecting grounds.

Thus labor for rubber collecting must be recruited anew every year. Agents of the *patrãos*, or proprietors of the land grants which are to be exploited, tour the northern coastal cities to hire seringueiros (collectors), and bring them up in company launches. They are a promiscuous lot, Portuguese, Italians, some Spaniards, Brazilians, Indians, coolies from Calcutta who have drifted down from British Guiana, half breeds, mulattoes, negroes from the West Indies. To train such a crowd each year in the best and most systematic methods of rubber collecting would be impracticable. Indeed, any attempt in this direction would be seriously resented. The seringueiro is hostile to the merest apology for supervision by the fiscales or foremen, who rarely make any real effort to protect the interests of their employers. So long as the collector delivers a fair weight of rubber from month to month he suffers practically no interference or direction. The process of rubber collecting in Brazil is thus in practically the same position today that it was before white man set foot on the shores of America.

There are numerous plants and trees that yield a milky fluid or "latex" from which rubber can be made. Of all these, the Hevea stands out as preëminent. There are seventeen varieties of Hevea, of which the Hevea Braziliensis, a large tree seventy-five to a hundred feet tall and four to eight feet in circumference, is the most important. The best rubber is produced from the black Hevea Braziliensis, and is known in the trade as "fine hard Para." The white Hevea yields a weaker rubber (hence, "fraca") with less resiliency than the best Para, and sells for 20% less. Broadly speaking, the black is found in districts along the upper Amazon and its branches; the white, nearer the mouth of the river.

Rubber "latex" is not strictly sap, but it is obtained in much the way maple sap is collected for sirup. A V-shaped incision is made in the bark of the tree — in Brazil this is made with a small ax (machadinho) with a long handle and a blade one to two inches broad. A little tin cup is placed to catch the oozing drops. Beginning before daybreak, at about four o'clock, the collector follows a zigzag circuitous path already blazed for him by the "matteiro," whose particular task this is. He gets back to his starting point at about nine A.M., after having tapped perhaps a hundred trees, more or less. He then starts on his circuit anew to collect the latex from the receiving cups.

Even to this point in the process, there is ample room for the exercise of judgment and skill, the absence of which means inferior rubber. Of the many varieties of trees from which latex may be obtained, the Brazilian collector rarely concerns himself about the selection of the best. He taps whatever he comes upon, mixing the poor with the good. Unless great care is used, almost every stroke of the machadinho penetrates to the cambium, exposing the tree to the ravages of insect borer and white ant and curtailing its productivity. If pressed for time, the collector may "bleed" the trees by not allowing the prescribed interval of one day between tapping. He may even kindle slow fires at their base in order to hasten the flow of latex, although this kills them. Merely keeping his receptacles clean — of which he is never guilty — would increase his output of fine rubber by not less than five per cent.

Upon the completion of his second round, the collector carries the latex to his smoke-hut to cure it. This is done by smoking it over a fire of urucury nuts, which create a dense smoke containing a large percentage of carbonic acid gas. He dips a stick or wooden paddle into the latex, and slowly revolves it over a funnel placed above the fire. As soon as the latex has coagulated, he repeats the process, until at last he has a "biscuit" the size of a man's head or larger.

Here again a little care would pay in a greatly improved product. No effort is made to keep the latex clean. Sometimes foreign matter is deliberately added to increase weight. Amazon rubber contains fifteen to forty per cent of impurities, such as leaves, sticks, dirt, nails, chunks of wood, even ax heads and pieces of iron. The manufacturer finds that the cost of cleaning and the loss of time more than offset the disadvantages of using inferior rubber which has been properly prepared.

The evils resulting from the promiscuous and ever changing character of the labor supply are enhanced by the peculiar contract between the patrão and the collector. The latter receives no money wage, but is entitled to 50% of the rubber he delivers during the season. In actual fact, most of this fifty per cent also goes to the patrão. The patrão supplies the collector in advance, not only with his transportation to the collecting field, but with practically all of his daily necessities, food, clothing, etc. These articles, in the first place, are all imported from other states of Brazil or from abroad. Nothing is produced in the Amazon region. The importers sell them to merchants (aviadores) in Manaos and Para at prices amply sufficient to cover tariff, freight, and risks of non-payment. The aviadores engage to supply the collecting districts on credit, to be paid later with rubber. The patrão of the rubber estate in the collecting district, as we have said, advances the goods to the seringueiro, also on credit against payment in rubber later. At each change of hands an exorbitant profit is tacked on, so that by the time they reach the collector they are priced at four times their value even at the port of receipt, Manaos or Para. The rubber estate is frequently mortgaged to aviadores. Similarly, the collector quickly runs up an indebtedness that confiscates his share of the rubber and binds him over to the patrão. The patrão may think it to his interest to keep the collectors in virtual peonage, but the arrangement gives every incentive to cheat and to adulterate the product. The collector knows he will be mulcted in any case, and is readily persuaded to sell part of the rubber (which is not his to sell) to the Syrian regatones or peddlers who cruise up and down the rivers, offering merchandise and strong drinks for exchange. Moreover, the high prices prohibit proper living and bring on debility and fever. No sick man under any circumstances can do efficient work, but the seringueiro, taken to task for his idleness and failure to turn in sufficient rubber, is given an added incentive to pursue improper methods of collection and preparation.

These difficulties stand in direct contrast with the advantages of rubber production on Eastern plantations: (*a*) a plentiful labor supply (*b*) working collectively and (*c*) methodically under competent management (*d*) with the support of large capital investment, facilitating the application of machinery, experimentation, and improved methods of production characteristic of large-scale enterprise. Brazil's decline in the world's rubber market, since the first trees planted in Ceylon in 1876 as shade trees for tea and coffee began to yield, was only to be expected. Exports of Eastern rubber, amounting to four tons in 1900, averaged about 450,000 tons during the years 1919/21 — almost two thirds of the total world production of rubber. And there is plenty of room in the East Indies for future expansion.

Brazil, however, has certain advantages that she may yet be able to exploit, and so meet Eastern competition — provided she can overcome her disadvantages. Amazon rubber, properly selected and treated, is said to be superior to the Oriental product, and more cheaply obtained. The wild tree in its native habitat requires no appreciable attention for production and upkeep, and yields eight to twelve pounds of latex,* three or four times as much as the plantation tree; and the product is unsurpassed in strength, elasticity, stability, and durability. Plantation rubber is "overmilled," and consequently lacks "nerve."

No solution can be found for the periodic flooding of the Amazon, but the resultant evils may perhaps be minimized. Trying as the climate is, the East Indian climate is said to be still worse. There is less humidity in Brazil during the dry season, and the temperature seldom goes over 98°F. By making living conditions more attractive, a larger and more intelligent labor supply may be induced to enter the field. Brazil, like the East Indies, may draw upon China's millions. First, however, the cost of living must be reduced.

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* Partly due, perhaps, to the earlier age at which the trees are tapped in the Orient.

It may be possible in some places to encourage the planting of food crops close to the rubber regions. The foreshores of the waterways, when the rivers are low, have an ample area of agricultural land of the finest quality, suitable for the cultivation of beans, corn, farinha, and other staples. Cattle can even be raised to yield a supply of fresh meat. Tariffs on necessities should be abolished, and, above all, the present pernicious trucking system described above should be stopped. At the same time some method must be found for systematic management and administration, with insistence upon improved procedure for tapping and preparation of rubber. Continuity of control over individual employees is a first requisite. A permanent labor force, at least a nucleus, should be recruited, perhaps by the importation of contract labor obligated for a given number of years. With any such arrangement, however, must go plans for the steady employment of this labor during the flood months, and a proper community organization with adequate hospital service and sanitation.

These remedies all suggest that the solution of Brazil's rubber problem is a task for large capital enterprise and responsible control, assisted by enlightened government coöperation. The United Fruit Company has shown what may be done in the tropics by large capital and wise management. It employs a force of over 60,000 workers, a large proportion of whom are imported from places outside of the producing regions. The rubber collectors in the Amazon country are said to number only 20,000. And fruit offers no such market prospects as rubber, either in respect to the value of our total requirements or the prospects of rapid increase in demand.

Brazil, for her part, cannot afford to lose the advantage of this wonderful potential resource, especially as she has the largest consuming market of the world as a near neighbor. And for us, such an opportunity is of greatest interest, since by assisting Brazil to recover her position, we should gain the advantage of having, for the supply of a material upon which we are becoming increasingly dependent, a source unhampered by any sort of control exercised by our European competitors.* Our industries would receive a reflected benefit from the increased buying power Brazil would gain through her sales to us, and the purchases she would naturally make in this country. It would seem, in short, that here may be a wonderful opportunity for American enterprise.

Cocoa

Cacao (cocoa), like coffee, is a comparatively new commodity in commerce. The value of our imports of cocoa is about a fifth the value of the coffee we import, but the future for cocoa is very bright. Unlike coffee, cocoa has real food value in addition to stimulating effects. According to the Department of Agriculture, it contains 2300 calories per pound, and chocolate 2800 calories, as compared with eggs, 720, and beefsteak, 985. On account of its food value it has been adopted as an important item in the soldier's ration. Campers use it. What American boy can get along without his chocolate ice cream or stick of chocolate candy? Our demand always runs ahead of the supply. Every decade we import two to three times as much as the preceding decade:

United States Imports of Cocoa (Average per Annum)

1889/91	19	million	pounds
1899/01	41	,,	,,
1909/11	126	,,	,,
1919/21	350	,,	,,

Like so many of our "newly discovered" commodities, cocoa has been known and relished for many centuries in the

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* Great annoyance has been expressed by our manufacturers on account of the heavy export taxes levied on rubber from the British East Indies.

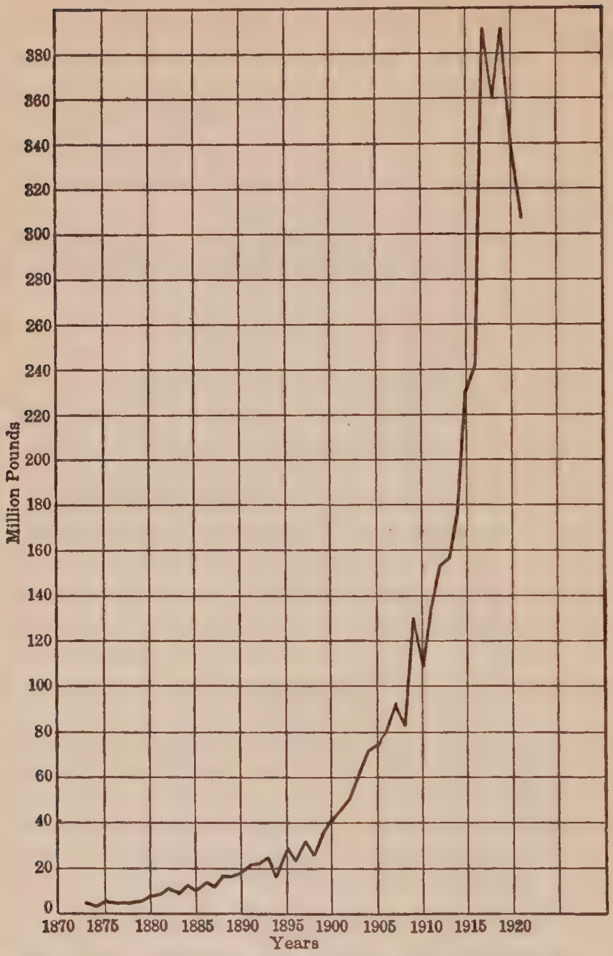

Fig. 25. Cocoa Imports into the United States, 1873 to 1921.

countries where it is indigenous. The "theobroma" tree ("food for the gods") is a native of the coastlands of the Gulf of Mexico and southward to the Amazon valley. Cortez referred to its cultivation by the natives in a report to the king after his conquest of Mexico. At the time, however, cocoa failed to win appreciation in Europe, for the natives used it in a sort of soup concoction mixed with corn meal and plenty of red pepper. About the end of the 16th century some Spanish nuns hit upon a more palatable mixture with vanilla and cinnamon. At twelve francs a pound — and a franc was worth much more then than now — cocoa long remained a luxury beyond the reach even of kings.*

The cacao tree grows wild in the Amazon valley, but it was not brought to Bahia, where now 80% of Brazil's crop is raised, until 1780. Production remained inconsiderable until about fifty years ago. Expansion since then has been due to no particular effort on the part of the planters to sell their product, but simply to the increasing demand, coupled with Bahia's remarkable natural conditions favorable for growing the plant — conditions better adapted even than those of Ecuador, which produces the best cocoa in the world.

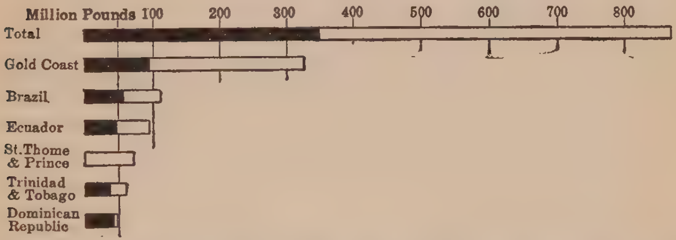

FIG. 26. Cocoa-producing Countries of the World, and United States Cocoa Imports.
(Showing the total output and the output of each country, average annual 1919/21; the portion imported by the United States, in black.)

The requirements for growing cacao are similar to those for coffee, but somewhat more exacting. The temperature should be between 70° and 90° F., never below 60°. Thus cacao is found only between the latitudes of 20° north and

* Louis XIV was obliged to stop serving it to his guests on account of the extravagance entailed.

south, while coffee is more widely distributed. Nevertheless, the cacao tree, like coffee, is injured by direct sunshine. For best results it is necessary to plant shade trees, and only special kinds at that. When the plants are young, bananas, plantains, or other crops that can be cut down without sacrifice after three years are best for shade. They should be planted six months or a year before the cacao in order to give sufficient protection to the young seedlings. Too much shade, however, is bad, producing weak and spindling plants. As the trees grow, therefore, the temporary shade crops must be cleared out, leaving only the permanent shade trees already planted in anticipation. Even the mature tree needs protection, and the soil itself loses much of its fertility if exposed to the direct sunshine.

Rainfall must be from 50 to 100 inches or more. Where the soil is thin or does not retain moisture, the heavier rainfall is necessary. More than 196 inches, however, is distinctly unfavorable. In some places drainage is advisable; in others, irrigation. A slow, continuous rain with constant cloudiness is detrimental.

In most cacao-growing countries, constant care is required in fighting blights and insect pests. Innumerable diseases attack root, stem, leaves, or fruit. Dead branches or rotting wood are insect breeders, and must be promptly cleared from the vicinity of the trees. Branches infected with disease must be cut away and the wounds carefully sealed. In Brazil, no such attention as we have indicated is bestowed. The trees suffer neglect that in most countries would result in their speedy death. Little pruning is done; they are allowed to grow up among weeds and shrubs that compete with them for the soil's nourishment; shade trees are seldom planted. Yet so favorable are the natural conditions for the cacao tree that it maintains itself notwithstanding.

Picking and preparing the fruit for market also require considerable care and skill. It should be picked before it is fully ripe, as can be ascertained by its color. Caution must be used in cutting off the fruit to make a clean stroke. Special tools are needed, and trained pickers.

The fruit is a large pod, four to six inches long and two or three through the thickest part, containing a white, slimy pulp in which are the seeds. The pods are collected in heaps by women or boys. The husks are then split open by a dexterous knife-cut and the contents thrown into baskets. A picking gang — two pickers, a woman to collect the pods in small heaps, and a man to bring these into large piles — gather about 3000 pods a day, the equivalent of 220 pounds of prepared cocoa.

The pulp is carried to boxes or vats, covered with banana leaves, and there allowed to ferment. By the process of fermentation the sugar in the pulp turns to alcohol and the alcohol to acetic acid. In this chemical change the temperature is raised and the seed itself killed. The substances which the seed contains thereupon begin to react on each other, forming "cocoa red," a dry, tasteless powder of reddish brown color, and an "essential" oil, small in quantity but remarkably strong in taste, which lends cocoa its peculiar aroma. Theobromine is liberated, which gives cocoa its stimulating effect, and the very bitter-tasting "cacao-ol" is partially converted to a tasteless compound. When the pulp has turned to alcohol and acetic acid or vinegar, it is drained off. The seeds are then dried by sun or by steam heat, and sorted.

Care must be exercised in preventing the process of fermentation from going too far, and in mixing the mass properly in order that all parts may undergo equal treatment. The amount of fermentation required also varies with the particular variety of tree. Proper sorting and grading permits better prices for the best qualities. In Brazil, most of the planters are small proprietors. Their attention and skill in the preparation of cacao for the market is as deficient as their scientific care in planting and cultivation of the tree. It is exceptional to see high-grade machinery for fermenting, washing, and drying, such as is common in Trinidad. The price of Brazilian cocoa reflects this situation.

Brazil produces less than 15% of the world's output, but her area available for expansion extends hundreds of thousands of square miles, even after the coastal strip where it is now cultivated has been fully taken up. Bahia alone could produce five times her present amount of cacao if she were able to secure proper labor.

Brazil's immediate problem, as before, is the labor supply. Climatic conditions for cacao growing are not agreeable to whites, but an outlay of capital on a scale sufficient to establish hospitals, good housing and proper sanitation, to import suitable labor, and to introduce advanced methods and equipment, etc., would undoubtedly open up an immensely profitable field of production. A cacao plantation, indeed, is said to be one of the most profitable possessions known. The expense of planting is not more than 60% of that for planting coffee, and the cost of production is a mere fraction of the selling price. Our cocoa imports are two and a half times the value of our imports of bananas, and, as has been noted above, our consumption is trebling every decade. That Brazil's interest coincides with ours, and that she would be favorable to American enterprise, can hardly be doubted, for the United States is the leading market for cocoa. We take over a third of the world's total imports — two and a half times as much as Great Britain, three and a half times as much as Germany or France.

Other Products of Brazil

Yerba maté from Brazil may soon find a place beside coffee and cocoa. This is a beverage as yet practically unknown in this country, but a universal drink throughout most of South America. It is the chief product and export commodity of the state of Parana, and is grown also in Santa Catharina, Rio Grande do Sul, and Minas Geraes. It is made from the dried leaf of a wild shrub. Its properties, according to report, are so remarkable that it seems only a question of time before other countries acquire a taste for it. "Take a good bowl [of maté] with a crust of bread at 4 A.M.," says Oakenfull, "and you may work in the harvest field till noon. . . . During the war with Paraguay, the soldiers marched and fought day after day without any food but maté." In Argentina, where beef is the staple food, maté prevents the natural effects of such concentrated meat diet and acts as a blood purifier. Physicians urge its virtues as a gentle stimulant and corrective of many stomach, liver, and kidney complaints. It has all the virtues of tea and coffee with none of their after-effects. The Société Française d'Hygiène, in 1909, voiced its opinion by unanimous vote in favor of maté as a beverage, and the French Red Cross used it during the War. It was said that when maté was first introduced into London nearly two hundred years ago, tea merchants faced such serious injury to their trade on account of its popularity that they spread reports and propaganda to the effect that it was injurious to health and physical appearance. Their campaign was so successful that maté was thenceforth tabooed.

All varieties of fruit grow in profusion in Brazil. Our California navel or seedless oranges are degenerate offspring of oranges indigenous to Bahia that reach six inches in diameter without any great care or science. Guavas grow in woods throughout the country. Bananas can be raised from Amazonas to Santa Catharina. Apples in Minas Geraes weigh nearly a pound apiece. Olive trees can produce much more per tree than in Italy. But why stop to enumerate! The climate of Brazil is said to be suitable for every possible kind of fruit. With the increased use of refrigerator ships we may soon enjoy guavas, pineapples, and many other tropical and subtropical fruits "out of season."

Innumerable drugs and medicines, gums and resins are obtained from plants abounding in the forests. It is interesting to note that the country itself received its name from one of its dyewoods, "brazil," which was somehow known in Europe and mentioned by writers a hundred and twenty years before the historic discovery of Brazil. The location of the country that produced the dyewood was at the time unknown, but it was thought to be a floating island in the Atlantic Ocean.

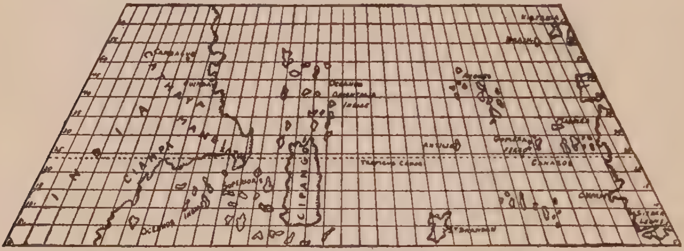

Fig. 27. Toscanelli's Map of the World.

(Section showing Brazil as an island off the coast of Europe. Copied from the reproduction in R. P. Porter's "Japan, the Rise of a Modern Power.")

Brazil has an unlimited variety of woods, many of which will be found useful for paper manufacture, and beautiful hard woods for cabinet work. Almost half of her total area is covered with forests. In the south, at present economically inaccessible, are the valuable Parana pine timberlands, twenty million acres of trees forty to seventy feet high and ten to eighty inches in diameter.

In addition to the numerous commodities referred to above, Brazil raises most of the very products that Argentina does. We need not go to Buenos Aires for hides. Brazil has practically the same number of cattle as Argentina, about thirty million head, tying for fourth place after India, the United States, and Russia. The one state of Matto Grósso (530,000 square miles) could swallow the whole cattle-raising country of Argentina, and there would still be available as much again in Goyas, Minas Geraes, São Paulo, Parana, and Rio Grande do Sul. The state of Rio Grande do Sul feeds nine million head, or one hundred per square mile. This may be compared with the province of Buenos Aires with seven and a half million head, sixty-five per square mile.

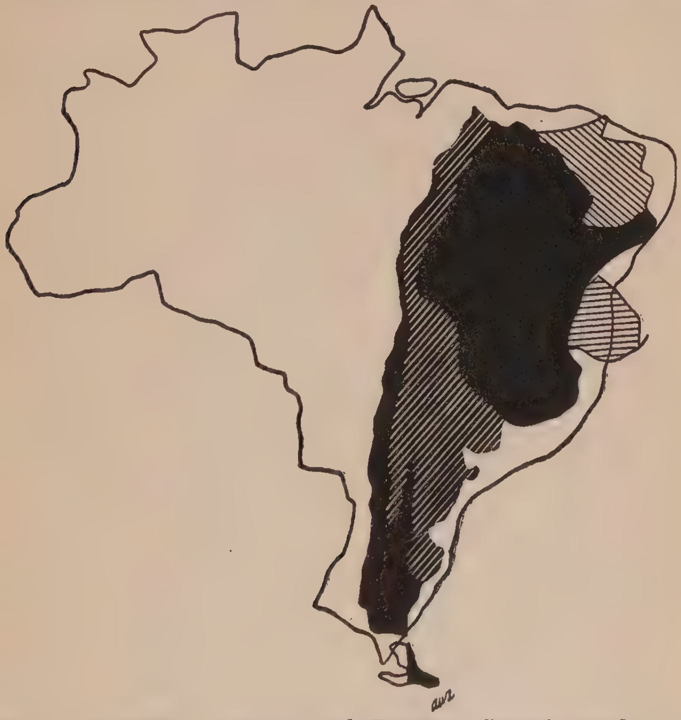

FIG. 28. Argentina, Uruguay, and Paraguay Super-imposed upon Brazil.

(Showing the relative area. The white-lined region of Argentina is semi-arid.)

The impression seems to be prevalent that behind Brazil's four hundred mile coastal strip there lies nothing but Amazon jungle, the abode of reptiles fifty feet long, boa constrictors, spiders six inches in diameter, ants an inch and a half long with painful or dangerous bite, of poisonous herbs, insects, and fever germs; where the air is hot, steaming, stagnant, like a huge hothouse; where foliage is so thick that a man is hidden a yard off, and one must carry a light to see the tree trunks in the forest gloom; where the floor is nothing but a tangle of roots and living things, or a swampy fen; and where cannibal Indians lurk with blowpipe and deadly poisoned arrow. But the Amazon valley, to which this description applies, covers only the northern part of Brazil, or about two fifths of the area. The country lying back from the river and its tributaries — a region fully as large as that of the Amazon valley — is a wonderful savannah land or grassy prairie, thinly wooded, with gently rolling hills and climate warm but dry and healthful. It is fertile, capable of raising three crops of corn a year; but before it is applied to agriculture, it is destined to become the greatest cattle range ever known in history.

Natural pastures, more accessible, covered with all kinds of grasses suitable for grazing, are found on the São Paulo side of the Parana River and in the uplands of São Paulo, Rio de Janeiro, Parana, Rio Grande do Sul, Santa Catharina, and Minas Geraes. In such regions the outlay to fatten one steer for six months is less than half as much as in Argentina. It is possible, as demonstrated on the model farm at Ganellena, to raise ten crops of alfalfa in a year, and land planted with grain and alfalfa (a hardy clover particularly rich in food value) can yield from two or three to six times as much meat as the best pasture lands, and with several times the profit.

Hitherto Brazil's stock has been inferior in size. Cattle have been raised for "charque" or dried beef, which requires lean meat. Although the meat of these animals is said to be superior in flavor, each steer furnishes only half the weight of beef as compared with those of Argentina and Uruguay. In fact, the meat production from these vast herds is actually insufficient to fill Brazil's domestic requirements, and she imports a fifth of what she consumes.

It was the invention of refrigeration, placing a premium upon large stock carrying plenty of meat, that brought about the enthusiastic improvement of cattle breeding in Argentina. She started hardly forty years ago, without the advantage of the scientific knowledge that has been acquired since, with only nine million head, and of inferior breed to those of Brazil today. She had to face North American competition in European markets and to educate them to receive the South American product.

Similar development has been delayed in Brazil by difficulty of transportation. Cattle driven on the hoof four hundred to a thousand miles to the slaughterhouse arrive little more than skeletons. In regions nearer the markets and ports of export, however, cattle breeding is now beginning in earnest. The first "frigorifico" was built at Barretos in São Paulo in 1913. Exports of chilled beef began in November, 1914, with a pound and a half as an experiment. In 1919, they had reached the figure 1.2 billion pounds — which may be compared with our exports of beef, fresh, canned, and cured, during the same year, of less than a quarter that amount. Brazil has three times the stock to work from that Argentina had, better stock at that, and ample room for expansion. As her railways are extended into the interior, we may expect Brazil to follow Argentina, and with great strides.

But so far as our interest is concerned, we need not wait for Brazil to build her railways. What we want is hides, not meat. In well-populated countries, hides are a by-product of the meat industry, and the supply of hides is governed by the demand for meat. The demand for hides, however, outruns the requirements of meat. We must look for a source of supply of hides, therefore, which will be independent of the question of meat. Such a source can only be in frontier lands. Hides are distinctively a frontier product, for they are capable of transportation over long distances without injury, while meat is perishable. No better source for hides could offer, in short, than the frontier regions of Brazil.

The commodities we have been considering are those in which the United States is particularly interested. Brazil produces many other commodities that are of greater interest to Europe than to us, but which deserve mention, inasmuch as they afford a basis for exchange between Brazil and Europe that may well prove detrimental to our own opportunities unless we are quick to exploit our favorable position.

Cotton, for instance, is Brazil's major export to Great Britain. It thrives especially in the northeast corner (Pernambuco, Parahyba, Rio Grande do Norte, and Ceara). Its fiber is said to be as long as that of Sea Island cotton, and the output might easily be increased from the present 500,000 bales to twenty million. Professor Green, in 1916, before a Cotton Conference at Rio de Janeiro, stated that "after three years of observation and experiment in Brazil, I am convinced that this country, above any other, possesses excellent natural conditions for cotton production."

Other fiber plants, hitherto unexploited, grow in richest profusion. Oakenfull asserts that they will become one of the greatest sources of wealth of the Republic.

Although Brazil is herself an importer of wheat, there are large tracts of fertile land in São Paulo, Minas Geraes, Goyaz, Parana, etc., ideal for wheat growing, regions which may some day produce immense crops. Corn, never exported from Brazil before 1916, is a staple crop. Her yield (over five million tons in 1916) follows closely that of Argentina, the second largest producer of the world (the United

States, of course, being first). Formerly an importer of beans, Brazil became an exporter to the extent of $10 millions worth in 1917, and that without the least apparent effort. Rice is the staple in place of bread throughout the tropics. In its growth it needs about half an inch of water per day for ninety days, great humidity, constant rains. Wheat requires dry summers. The kernels of rice contain less oil than wheat and can therefore keep longer in moist climates without getting moldy or wormy. The yield is two or three times as heavy per acre as wheat, and can accordingly support a much denser population. If ever the world's supply of bread becomes inadequate through wheat shortage, tropical countries, Brazil among them, can supply the deficiency with unlimited quantities of rice.

Sugar production is an old established branch of agriculture in Brazil. She began exporting to Portugal a few years after first settlement and for a long time was the chief source of supply for Europe, but she has since been displaced by the West Indies and Caribbean coast regions, which yield four or five times as much per acre. Since the abolition of slavery, also, many plantations have been abandoned. Nevertheless, up-to-date machinery is being introduced, and Brazil may sometime be counted upon again for an appreciable share of the world's supply. Indeed, her sugar exports in 1920 (chiefly to Argentina) were second in value to her exports of coffee.

Mineral Resources

The mineral resources of Brazil have scarcely been touched — only those have been exploited which are most valuable in proportion to their bulk, such as gold and diamonds. Improvement in transportation facilities will make accessible deposits of nearly every mineral used commercially. Not much that is definite can be said with regard to the extent of these deposits, however, for little is definitely known.

If half what geologists have claimed for her is true, Brazil will some day be one of the richest mining countries of the world. Her deposits of high-grade iron ore — richer in metallic content than Swedish ores — are thought to be the greatest in the world. The central part of Minas Geraes, it has been estimated, has between six and twelve billion tons. Other reserves, thought to be very extensive, occur elsewhere in Minas Geraes and in all the states to the west and south, except Rio de Janeiro. Unfortunately the cost of transportation from the mines to tide water (225 miles to Rio de Janeiro), the heavy grades on the railroad, and the absence of workable bodies of coal near by and suitable for smelting the ore to reduce the bulk for transportation, have prevented extensive exploitation of the reserves.

Manganese has been the most important industrial mineral exported from Brazil. It is used chiefly in the manufacture of steel of particular qualities. The United States consumes about a third of the total used in the world. It occurs in large quantities in our own country, but in reserves of low-grade ore. We have only insignificant resources of high-grade ore, such as is required for structural steel, wire, sheets, etc. Thus the large deposits in Minas Geraes and other states of Brazil have been of considerable interest to us. Before the War we took three fifths of her exports of these ores, most of the balance being divided equally between Great Britain and Germany. During the War our steel industry was almost entirely dependent upon Brazil. It is possible, however, that our requirements will decline with the introduction of newly discovered processes which will enable us to use our own low-grade manganese. Europe's requirements before the War were met chiefly from Russian ore deposits in the Caucasus Mountains and from India. As conditions settle back to normal, she will doubtless return to these sources of supply.

Monazite sand is a rare mineral that has attracted much attention in Brazil of recent years. Although it is found in many other places, the Brazilian deposits are much the most important, and have supplied, and will continue to supply, the greater part of the world's requirements (now about 3000 tons per annum). It is used principally in the manufacture of thorium nitrate used for Welsbach mantles. About 1885 an American engineer named Gordon discovered monazite in Brazil, found a market for it in Germany, and obtained a monopoly of the supply. In 1902 he combined with the German and Austrian manufacturers to control the entire industry. Until the War, although other sources of supply had been found and independent manufactories established, the Germans still held a virtual monopoly, but during the War the American manufacturers got control of the industry, and have since supplied England and France. Today there is a movement in England to develop her own manufacture from supplies of monazite in India, and thus to become independent of the United States.

Gold occurs in every state of the Republic. Nevertheless, Brazil has never attained first rank in gold mining, and today the industry is confined to a very few localities. Until recently, "placer" deposits in alluvial sands have been worked, but for several years lode mines have yielded greater returns than the placers. One of these mines, the Morro Velho in Minas Geraes, is said to be the deepest mine in the world — over 6100 feet, of which 3300 feet extend below sea level. The temperature at the bottom is 115° F.

A hundred and fifty years ago, Brazil led the world in diamond mining. A priest, about 1725, recognized some diamonds found by gold washers in Tejuco, now Diamantina, in Minas Geraes. The gems are often found in "potholes" worn out by streams during the rainy season. In one such pothole were collected ten pounds of diamonds. Some of the finest gems in existence have come from Brazil: the Star of the South, the Star of Minas, the Dresden diamond. The largest black diamond in the world (carbonado) was found in Bahia, and weighed 120 carats more than the famous Cullinan diamond from South Africa. Since the opening of the South African fields, Brazil has declined to a secondary place. Her supply is still far from exhausted, however, although it is estimated that from two and a half to four tons of gems have been obtained since their first discovery. New finds will continue to be made, for there is much virgin territory left, and many deposits will justify re-working.

The United States has hitherto been absorbed in the exploitation of her own vast resources. Other nations, less richly endowed, have been forced to adopt a more far-sighted policy. Great Britain and Germany, notably, have been busily extending their control, financial and political, over reserves in other countries. Metals "constitute the basis of modern civilization and power over man and natural forces." In the new international era initiated by the War, with the great surplus of money capital accumulated in this country and available for investment, we shall do wisely to consider extension of economic control on our own part in the direction of valuable mineral resources outside our own boundaries. And few fields for exploitation in the near future give better promise than Brazil.

Brazil's purchasing power, expressed in exportable commodities required by the United States, is practically unlimited. Let us turn now to the consideration of her prospects as a market for American products.

As a Market for American Manufactures

The population of Brazil is reckoned at about 25.5 millions, three times that of Argentina. We cannot count the whole of this population, however, as a consuming market for our products. Argentina's population is almost entirely of European descent or mestizo. Brazil has a great number of negroes, Indians, and half-breeds. The proportion is greatest in the northern states. African negroes were first imported (1574) to supply labor for the sugar plantations in Bahia. They are still most numerous in this state and in Pernambuco. Four fifths of the population in the city of Bahia, it is estimated, have negro blood in their veins. Pierre Denis has little favorable to say about the negroes in these regions. "Taking them all in all, the negroes in the sugar-producing regions form a type of laborer of very indifferent economic value. They have no foresight and are innocent of any form of ambition, the sole motive power of progress. They are modest in their desires and easily satisfied. . . . More than half their life is devoted to amusements and festivals."

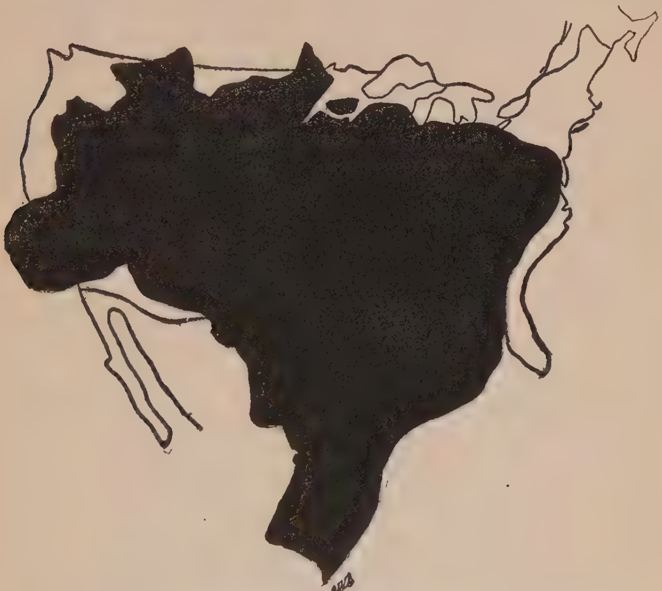

FIG. 29. Area of Brazil (compared with the United States).

The negroes are to be found in large numbers no farther north than Parahyba, the limit of the cane fields. In Ceara and the Amazon valley the population consists of crossbreeds of Portuguese and Indian descent, a mixture that seems to have retained the hardihood of the aborigines under the trying climate, without their faults.

Pure-blooded Indians are found now only in the remote upper reaches of the Amazon and the Paraguay rivers. They number perhaps 600,000. Although they are cannibals and eat their enemies, they are not bloodthirsty, like the North American Indians, and never torture their captives. They have been irreconcilable to the advancing white peoples, but with proper treatment may become perfectly friendly. The French have known how to make them faithful allies, and the Brazilian engineer, Col. Candido Rondon, has succeeded in winning the trust of the sturdy Indians in Matto Grosso.

European migration has proceeded chiefly to the southern states. In São Paulo the Indian strain is only slightly noticeable, and indeed such sign of it as remains is a matter of pride among the "Paulistas" on account of the traditional bravery and enterprise inherited from the mixture. Thus, although the extent of the market can be roughly guessed from the racial composition of the population, this is not a clear-cut line of demarcation. Many of the best families, many men of high distinction, have kinky hair or evidences of Indian ancestry. Probably half the people have at least a trace of negro blood. It is to be noted, however, that the proportion of negro and half-breed population of Brazil is said to be declining, and will disappear, so it is predicted, during the coming century.

The rate of increase of population of Brazil is slower than that of Argentina — about 20% per decade as compared with 25% for Argentina.* A glance at the population map,

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* Population of the United States increased at a rate of 30 to 35% per decade prior to 1860, when the total population numbered 31 millions; since then, at a decreasing rate, to 20% in the decades 1890 to 1910 and 15% during 1910 to 1920.

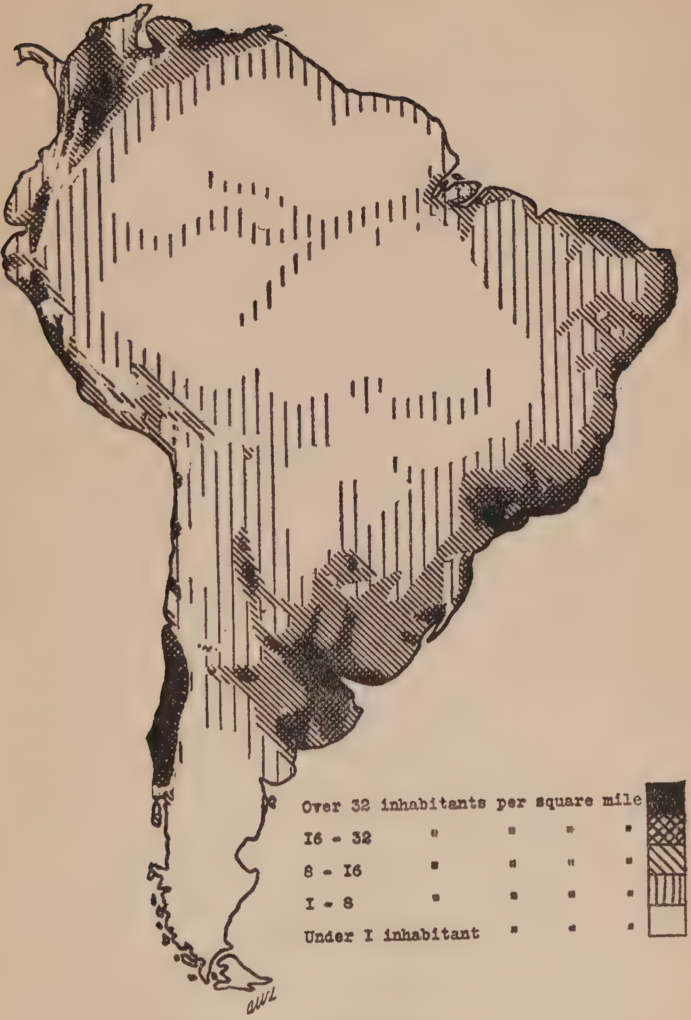

FIG. 30. Distribution of Population in South America.

however, shows concentration only in a few places along a narrow rim by the seacoast and inland perhaps some four hundred miles. Eighty to eighty-five per cent of Brazil's population lives on the coastal strip of less than 30% of her area. In absolute numbers, she has reached a point equal to ours in 1850, but in distribution she may be compared to the United States in about 1810. She has plenty of room for expansion; and heavy immigration from Europe may be expected during the next few years.

Like the Argentines, Brazilians are naturally extravagant and "spend their income as if they were clipping a coupon from a government bond," without the least thought of saving for possible lean years. The Brazilian woman especially has a taste for spending liberally. As in the United States and Europe, all classes dress alike, the lower striving to copy the upper. Every one dresses well, and fashions are the latest thing from Paris or London.* Moreover, the climate tends to cause deterioration of leathers and fine fabrics with surprising rapidity, so that the market is really more extensive than would be expected. Of course these remarks cannot be taken to apply without discrimination to all parts of Brazil. In so large a country, cities in one section may have characteristics entirely distinct from those elsewhere. Pernambuco is 2500 miles from Porto Alegre. Customs are as different as between Boston and New Orleans.

With regard to the market for producers' goods, we need only point again to her tremendous possibilities for development, awaiting, as we have noted, only an adequate labor supply — which may be afforded by European immigration — and improved transportation facilities. The whole country cries out for railroads. On the one side lies Brazil's vast undeveloped interior with its boundless resources. On the other are magnificent harbors. Rio de Janeiro has one of the three most perfect harbors in the world — practically a lake, seventeen miles long and fifteen wide, sheltered by high surrounding mountains and with an entrance less than a mile wide. But to connect the interior with the coastal regions there are only a few railway spurs and the navigable rivers.

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* It should be remarked, however, that this demand for fine goods and distinctive styles, as in the case of Argentina, may operate somewhat as a handicap on American manufactures of a highly standardized, medium grade. It is impossible to produce variety under a highly capitalistic system. The automobile manufacturer who paints his car bodies by dipping them in a large vat of black paint cannot offer the same car at the same price if he must employ extra labor, equipment, etc., to paint a few red for one customer, a few green for another, some yellow or blue, and so forth, as demanded by the particular taste of South American purchasers.

At present the railroads are confined almost entirely to the coffee regions about São Paulo and Rio de Janeiro. A quarter of the total mileage is in São Paulo, with an area less than 3% of the whole of Brazil. Even here there are only 3.6 miles of railroad to serve every hundred square miles of territory (compare the province of Buenos Aires, with 8.2). The state of Rio de Janeiro has the greatest railroad development in proportion to its area, with 6.64 miles per hundred square miles area. Minas Geraes and Rio Grande do Sul have only 1.75 and 1.82 miles respectively — less than the least developed state in our Union. The total mileage in Brazil is just about what ours was in 1855, and the increase in mileage since 1902 has been what ours was in the five years from 1850 to '54!

The chief reason for this backwardness in railway development has been Brazil's unfortunate topography. The barrier of mountains extending from the northeast corner almost to the southern extremity may offer marvelously beautiful scenic effects, but it also presents some extremely difficult engineering problems. Tunneling and bridging, cuts and fills, greatly increase the cost of building; and the distance occasioned by the innumerable curves and windings increases trackage and freight costs. In places, the gradient runs up to eight or ten per cent per mile;* auxiliary cables or rack roads have to be used, thus limiting the freight load per train. Besides these great elements of expense, necessitating an enormous initial outlay of capital, railroad building in Brazil, as in all undeveloped countries, must precede the movement of population and must rely for its earnings upon the prospective activity of pioneers.

Despite these obstacles, extensive plans are on foot for railway promotion. The most interesting and ambitious attempt was the "Brazil Railway," a company promoted by Mr. Percival Farquhar, a New Yorker, incorporated in Maine in 1906, and financed by French (chiefly), British, and Belgian capital. The project contemplated the acquisition of certain existing railways, joining them into a single comprehensive system connected with the roads in Uruguay, Paraguay, and Argentina, with the tidewater ports in Brazil, and with the interior river steamship service on the Amazon and its tributaries. In order to insure its own traffic, land was purchased for livestock ranches, and frigorificos were to be built to take care of the meat supply. Although the War forced the company into the hands of the receiver (W. Cameron Forbes), there is little reason to be pessimistic over the future. The imagination and foresight of a James J. Hill are what is needed. When once the great plateau regions of Matto Grosso and Goyaz have been reached, and the broad uplands of São Paulo, Parana, and Rio Grande do Sul, expansion will be as rapid as our own. Brazil, sleeping, will be awakened by the coming of the railroad.

Perhaps a solution, at least partial, for Brazil's railroad problem will be the application of electrical power for traction. We have found in our country that the application of electricity on mountain roads is particularly successful. Steeper grades can be taken, and at higher speeds, with electric locomotives. It is possible to distribute several light locomotives throughout the length of the train, all under multiple control by a single engineer, or better yet, to use cars, each equipped with its own motor, so that the entire weight of the train may be available for tractive effort. With the higher acceleration, less headway is needed between trains, and the traffic capacity over a given line is increased accordingly. The importance of this is especially great where single tracks are necessary — which is the case on pioneer lines, and particularly on mountain roads that have to pass along the edge of ravines, over lofty bridges, and through numerous cuts and tunnels.

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* 2% per mile is the limit generally adopted by engineering practice, 4% occasionally for short grades.

Although the use of electricity generally presupposes high traffic density if it is to be made a paying investment, in a country where coal is dear and electricity cheap, and especially where the advantages of electricity are so significant, this no longer holds true. Brazil's coal supplies are relatively inaccessible, and of medium grade, but she has enormous potential water power, about 25 million horse power. Brazilian estimates put the total at 50 million h.p. Our own total is given as 28 million. The total potential power of the Niagara Falls would furnish, if utilized, about 6 million horse power. At present the power actually developed amounts to about 800,000 h.p. The Sete Quedas Falls of Brazil have been estimated at 20 million h.p. The Guayra Falls, 300 feet high and two miles wide, pour down 13 million cubic feet of water per minute.

The larger proportion of Brazil's water power is located in the Amazon valley, but it is one of the particular advantages of electricity that it can be transmitted for long distances. Of more immediate interest, however, are the numerous streams of the coastal region. They are short, but their rapid descent in falls and cascades from the hills and mountains close to the shore affords numerous opportunities for power development. The Bracuhy Falls near Rio de

Janeiro have a drop of 2887 feet and a mean flow of 105 second-feet. The Herval Falls, north of Porto Allegre, drop 400 feet, and have a potential power of 750,000 h.p. The potential power of the coastal region totals about 3.7 million h.p.

The water power hitherto developed in Brazil, about 250,000 h.p., has been utilized for public service enterprise: tramways and lighting. Without doubt, considerable further development will proceed along these lines, but it is only a question of a few years before the general public will begin to appreciate the advantages of electricity. It will be adopted extensively for domestic and industrial uses. We may look forward, in short, to Brazil as a market of almost indefinite possibilities for our manufactures of electrical appliances and equipment.

With regard to other producers' goods, we may say that aside from such machinery as may be used on the coffee estates, simple tools are more suitable than high-grade machinery. Agriculture has not yet reached the plains of the interior, to which complicated harvesting machines, such as we use in the West, are best adapted. When these regions do become settled large-scale equipment may find an extensive market.

Attention is frequently drawn to the possible development of manufactures in Brazil. She is fortunate in the possession of certain natural advantages, reserves of raw materials and, with her water power and such coal as she has, plenty of power. Moreover, Brazil has adopted a policy of protection in order to foster her industries. She has placed a very high tariff upon imports of manufactures for consumption, with free admission of all kinds of machinery used in manufacturing. It is thus quite possible that some of the immigrants and part of the foreign capital for investment may seek industrial fields for employment. Already more than $160 millions are invested in manufacturing enterprise — $115 millions in cotton textiles alone. But after all, this is only $6.80 per capita, to be compared with our $228 per capita; and the number of employees is only one half of one per cent of the total population, as compared with 8.26% in the United States. Aside from industries concerned with the reduction of raw materials for economy in transportation, it seems unlikely that industrial development will be very rapid. The advantages of exploiting her natural resources are relatively so great that Brazil's best efforts for decades to come must be directed toward opening up her hinterland.

That Brazil will be a very rich market for manufactures, both consumers' and producers' goods, there can be not the slightest doubt. The only question is, "for whom?" Until the War, the United States supplied only about ten to fifteen per cent of her imports. Great Britain and Germany both sent her more than we: 25% and about 15% respectively. Since 1915, of course, our trade with Brazil has received a great stimulus — greater than our trade with Argentina in proportion to her total imports, though less in actual dollar value. In 1919 we contributed 48% of Brazil's imports, but in 1920 only 42%, and in 1921, 31%. The question is, *will* the United States retain her preponderance, or shall we

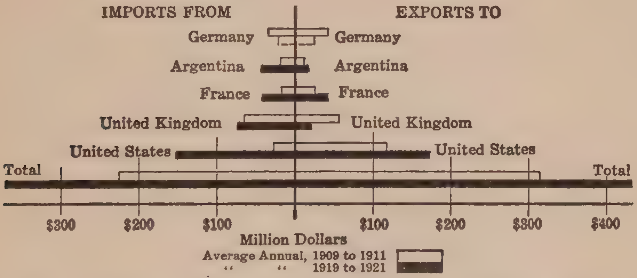

FIG. 31. Foreign Trade of Brazil, Annual Average, 1909/11 and 1919/21.

(Showing imports and exports, and major countries.)

return to our original position as second or third, and lose that trade which we have suddenly begun to protest to be "our share"?

"Our Share" of Brazil's Trade

Our share of trade in Brazil is exactly what we can get and no more. What we can get depends largely upon what we are willing to "put in." Brazil had no trade to speak of until Europe began to invest in her resources. European countries brought ships to carry her goods, built ports and dock facilities, established banks, loaned credit and capital, even supplied much of the labor by immigration from their own shores. We have done none of these things. We even import our coffee in British ships. Before the War England had from seven hundred and fifty million to a billion dollars invested in Brazil; France, about half a billion; Belgium, $150 million; the United States — $50 million! The figures tell their own story. It is only to be expected that Brazil should look to Europe for her imports.

The United States is nearer than Europe. From Rio de Janeiro to London is 5200 miles; to New York 4800 miles. The United States takes by far the greatest proportion of Brazil's exports — over 42%, while the United Kingdom takes only about 15%. And in 1906, we persuaded Brazil (by the gentle but effective argument of a tariff of 3¢ per kilo on coffee) to accord us upon certain articles a special 20% reduction of import duties in return for our heavy purchases of coffee and rubber. The sentiment of the Brazilians toward the United States, although naturally not so friendly as with the mother countries, and although ruffled at times by our somewhat too patronizing attitude, is on the whole agreeable enough. Why, then, have we so persistently passed her by to strain after a portion of the Argentine market, over a thousand miles further away and by economic law not ours?

Doubtless one answer is that until recently Rio de Janeiro, Para, Santos, and other cities along the coast were pestholes of disease. Travelers who entered knew that they carried their lives in their hands. However Europeans might feel about incurring the risk, it was not worth our while to stay in order to promote trade or investigate opportunities for investment. In 1906, however, Dr. Lauro Müller, then Minister of Public Works, with three other prominent engineers, undertook the complete sanitation of Rio de Janeiro. Hundreds of buildings were demolished in order to widen and purify the streets, tons and tons of garbage and filth that had been collecting for generations were removed, sewers were built, the swamps and marshes were filled in, the malarial and yellow-fever mosquitoes were exterminated. Before this, one to four thousand deaths from yellow fever used to be recorded annually; since 1911 there have been none. The death rate in Rio de Janeiro and São Paulo is about 20.8 per thousand, the same as Rome's; that of Bahia is 18.1, comparing with Paris 17.6, and London 16.5.

The maximum temperature of Rio de Janeiro is about 98° F.; on the heights above Rio only 90°. Compare this with Buenos Aires, 105° in the shade. And who can forget the experience of 114° F. in the shade in our own Washington, D. C.! The average temperature along the coastal plain is 66° F. The interior plateaus in Matto Grosso, Minas Geraes, and Goyas are extremely healthy, the water pure, the air dry, and the temperature mild. The aborigines are strong, healthy, and robust.

Even the Amazon region is not dangerous throughout its entire extent. The swampy tracts along the rivers, covered with decomposing vegetation, are good breeding places for malarial fever, but there are over 200,000 square miles "where the climate is glorious." Enock goes so far as to say that "the Amazon region is one of the best tropical zones of the world, and its climate is favorable to the development of European races." It is very hot in the middle of the day, but mornings are fresh, and evenings often made pleasant by a cool breeze. After Europeans have grown accustomed to the Amazon climate, they like it. In Manaos, 1200 miles up the river, but only a few feet above sea level and only 3.8° south of the equator, the absolute maximum temperature recorded is 99° F. and the minimum 66° F. Longevity is common; an authenticated case is given of a man who lived 145 years! The death rate of Para, practically under the equator, is now 20.2, which might be contrasted with Mexico City, 48.5, Cairo 34.6, or Calcutta 34.4. The temperature ranges from 66° to 91° F., and Para has been called the invalid's paradise. Most deaths are due to unhygienic habits. Negroes and lower-class mulattoes account for 75% of the mortality; and of the other deaths many are due to the carelessness of immigrants who have not yet adapted themselves to the living conditions of their new environment. In short, "it has been proved by experience," Buley says, "that European people can acclimate themselves rapidly and without inconvenience in almost every part of the country."

A second reason for our reluctance to develop business with Brazil may be a certain distrust upon the part of our manufacturers and exporters, a fear of trickery. This arises chiefly from the difference in manner between the Anglo-Saxon and the Spanish peoples. The Anglo-Saxon is by nature a bluff, crude animal. His maxim is that "brevity is the soul of wit." The British have learned to smooth down their rough edges and to show courtesy originally quite foreign to their nature; but Americans still exult in the brusque, abrupt approach, whether it be in our business correspondence or the personal visit of the solicitor. To us politeness means hypocrisy. Small wonder, then, that we fail to get along well with our southern neighbors. In Brazil even the car conductor tips his hat to you when you pay your fare.

Business is conducted over, or follows, a cup of tea and a pleasant chat. Friendly acquaintance is made the basis of the sale.

On the side of the Brazilian, we should remember, there are ample grounds to make him suspicious of the American. "Gringos," as he calls us without intent to compliment, have to be carefully watched. "Yankee trickery" is a byword — unfortunately only too well deserved. Complaints of neglect, carelessness, inattention to details, all of which cause annoyance and often serious losses, mingle with the lamentations of victims of the adventurers who have done so much during the years of our mushroom prosperity of War times to stain the name "American." We are so young in our foreign trade that it may be better for us to credit the Brazilian with having rather more right on his side than we may have on ours. Beyond a reasonable business caution, it behooves us now to overcome our provincial suspiciousness and to adapt ourselves, like our British friends, to manners unlike our own.

A third reason for our lack of interest in Brazil has been the instability of her financial conditions. In all South American countries (except Venezuela), as in all young countries where gold is scarce, the currency is chiefly paper. In some cases the paper is backed by gold sufficient, at least in normal times, to maintain exchange rates at par. This has been true of Argentina and Uruguay. Other countries have suffered more or less serious depreciation. Bolivia, Peru, and Ecuador are said to offer a reasonable expectation of recovery. Brazil, however, has been particularly unfortunate.

For some time after the establishment of the Republic, only thirty odd years ago, be it remembered (November 15, 1899), political conditions were disturbed by the efforts of General Fonseca to make himself a dictator, of Admiral Mello to depose Peixotto (who had followed Fonseca as president), and other such turmoils. Paper money, of course, was turned off the press in large quantities by each successive administration in order to meet the expenses incurred in getting into office and defending itself against opponents. The milreis, supposed to be worth originally 54.6 cents, dropped to 12 cents. (The lowest it had been under the Empire had been 37½ cents; the highest it has been since, under the Republic, is 33¾ cents.) The government had to default interest payments on the foreign debt, but a funding loan by the Rothschilds tided her over her difficulties, and, in accordance with the terms of the loan, she began to destroy her depreciated paper. By 1906 she had reduced the proportion to almost 20 of paper to 1 of specie or convertible paper. In this year the "Conversion Office" was established, with the object of accumulating a fund of gold. All gold brought into the country had to be taken to the office and exchanged for certificates of deposit. Thus in 1912 the total of inconvertible paper had been reduced to 40% of the total currency.

Early in 1913 this favorable progress was interrupted. A period of business depression set in. Coffee declined about 20% in price, and rubber over 25%. The latter, moreover, was feeling the competition of plantation rubber. The total value of coffee exports fell 42% between 1912 and 1914; and rubber exports fell 56%. Since coffee and rubber together represented 70 to 80% of her total exports, Brazil's purchasing power in foreign markets was immediately curtailed, and her imports fell 50%, from $326 millions in 1913 to $166 millions in 1914. At this time the government was deriving almost sixty per cent of its revenue from import tariffs. The effect of the reduction of imports upon the national exchequer is obvious.

In the last week of July, 1914, Brazil was successfully closing negotiations for another loan by the Rothschilds. The outbreak of the War, however, frustrated all possibility of obtaining such relief. Not only this, but her European markets were practically cut off — Belgium, of course, Germany and Austria-Hungary by the blockade, and the other nations by lack of cargo space and by deliberate limitation upon the part of their Food Administrators.

These difficulties during the War have not been without beneficial results. In the first place, the depression in her major lines of production forced Brazilian agriculturists to turn their attention to more remunerative lines. Beans, potatoes, refrigerated beef, corn, rice, etc., appeared upon the lists of exports, so that by 1918 coffee and rubber had fallen to less than two fifths of the total. At the same time, the government introduced economies in its administration, and adopted new sources of revenue. In 1917 and since, only about a third of the revenue has been obtained from import dues. Thirty per cent has been raised by internal taxation.

Unfortunately, Brazil had to print more paper money, so that the 600,000 contos outstanding in 1913 rose to 1,720,000 by the beginning of 1920 — a ratio of 1 of gold to 32.4 of paper. Since then, however, she has been able to add to her gold reserve, and, in spite of the increase in paper, to reduce the ratio to 1 to 22, not much worse than in 1906.

The present foreign indebtedness of the federal government, states, and cities, is about 900 million or a billion dollars, an enormous figure, which to us as a creditor nation is exceedingly shocking. This means a burden of $36 to $40 upon every man, woman, and child throughout the entire country; and an interest charge of perhaps $2 per capita per annum. Argentina's debt, however, is $84 per capita, with an interest charge double that of Brazil's. In judging the condition of Brazil, also, we would do well to glance back over our own history. The United States during the years from 1861 to 1868 alone borrowed from abroad an amount estimated at $1.5 billions, incurring an annual interest charge of $80 millions. Our population at that time was about 38 million, making the indebtedness $40 per capita and the interest $2.10 per capita per annum — and at that time $2 meant considerably more than today.

Brazil has reached a stage of development relative to her total resources comparable with our position more than a hundred years ago. Her burden of indebtedness cannot be judged as seriously as if she were an older country. Moreover, she has at her disposal all the inventions, all the science, etc., gained during the century. The speed of her development in coming years should be accelerated beyond anything remotely possible in 1810, or even fifty years ago.

Before the War, European nations showed their confidence in Brazil by investing some two billion dollars. That their confidence was not altogether misplaced may be gathered from the nice dividend record of the London and Brazil Bank, for instance, which ran from 15 to 20% per annum. There seems no reason for less confidence today. Brazil has received a valuable lesson in public finance; she has learned the danger of "putting all your eggs in one basket." Spreading her taxes over various objects will serve to stabilize her revenue, and diversification of her industries will stabilize her economic situation.

Politically, there seems to be no danger of serious upheavals or any reversion in her form of government. The United States of Brazil is a republic, with a constitution patterned after our own: a federal government seated in a Federal District at Rio de Janeiro, presided over by a president with a four-year term, a Congress with two chambers, and so on. The twenty states and the territory of Acre are more independent than ours today, as might be expected from the youth of the nation and the lack of facilities for communication, but one and all are loyal to the Republic. There is no slave question to vex the internal peace of the nation. Time will as surely weld them into a single national unit as it has the United States of America.

Brazil was unable to obtain financial assistance from Europe during the War. She certainly can have little hope of getting any for many years to come. She must look to the United States. We have in our hands most of the money capital of the world. We have owing to us millions more — so much that it will be impossible for Europe to liquidate her debt by sending commodities. If she pays at all, she must pay with securities, her holdings in foreign enterprises, and we shall have forced upon us the necessity of taking a more active interest in foreign fields.

But in any case, can we shut our eyes to this rich field of opportunity lying so close at hand? Brazil is a country upon the threshold of a vast development. Her resources are supplementary to our own, and we shall need her products in ever increasing quantities. Room for expansion is practically without limit. The only contingent factors are her labor supply and lack of capital. Her deficiency in labor will without doubt be met shortly by greatly increased immigration from the distressed countries of Europe. Capital it is our privilege to be able to supply.

CHAPTER VII

CHILE

Chile has always been important for her minerals: at first, for gold; now, for industrial minerals. She has a monopoly of Sodium Nitrates. Her Copper reserves, enormous though of low grade, may again become available through new economies in the extraction of metallic content. Her Iron resources are now commercially accessible via Panama, and also her other base metals. But heavy exports do not imply a proportionate import trade or market for American goods. A large share represents dividend payments, not purchasing power. The present consuming market is restricted. Mining employs few workers, and the bureaucracy supported by government revenues from mining demands luxury goods. Agricultural expansion is hindered by latifundia and competition of superior resources of Argentina and Brazil. Lumbering is insignificant. Manufactures, though apparently considerable, are in reality slight and promise little development in the future. Chile is chiefly attractive as a field for investment. Politically stable and able to protect herself against aggression, but less secure financially, and dependent too entirely upon mining, she is more suitable for the large investor than the small.

Mineral Resources

SINCE the day Francisco Pizarro, that indomitable Spanish soldier of fortune, first set eyes upon the fabulous treasure of the Incas of Peru (1527), Peru, Bolivia, which was then a part of the Empire of the Incas, and Chile have excited the interest of the world on account of their wealth of minerals. Pizarro never went to Chile. He contented himself with the richer booty already amassed in Peru, and having killed his royal host, he busied himself in shipping the gold and silver to his master, King Charles of Spain. To Almagro, his lieutenant, he delegated the task of exploration southward.

Almagro's expedition met with failure, but his successor, Valdivia, was able to establish himself at Concepción (1541). The native tribes, Auracanians, proved to be of different mettle from the Peruvians, and waged a continuous warfare upon the invaders until, after a full century, they were formally recognized as independent. In the meanwhile the Spaniards, harassed as they were, nevertheless discovered and began to exploit gold-bearing deposits that have become world famous: the "Madre de Dios" near Valdivia and the "Malga Malga" between Santiago and Valparaiso. So plentiful did gold and silver become that it is said that they were actually cheaper than iron and were used as substitutes.

Chile's placer deposits and surface outcrops of the precious metals have been well-nigh exhausted by centuries of exploitation, but there are doubtless hidden reserves that may be mined in time to come with modern machinery. At present her production of gold is less than one twentieth of one per cent of the world's annual output and her silver production under one per cent. In place of her precious metals, industrial minerals are beginning to claim attention. Until the opening of the Panama Canal, only commodities very valuable in proportion to their bulk could justify the cost of transshipment across the Isthmus, and the ten-thousand-mile water-haul round the dangerous Horn prohibited exploitation of the more bulky minerals, except sodium nitrate or saltpeter, of which Chile is the only source of supply in the world.

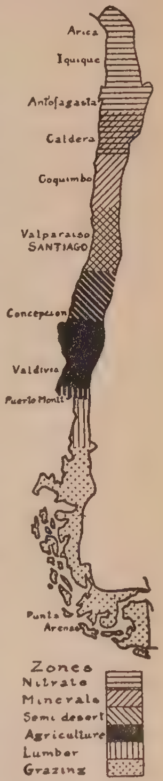

FIG. 32. Chile (showing the productive zones).

Nitrate Deposits

Sodium nitrate is Chile's most important product today. It was originally used only for explosives, but the discovery of its value as a fertilizer opened up an extensive market in countries of dense population where intensive agriculture is practiced. It has been found by experiment that the application of 129 pounds of nitrate per acre may increase the yield of wheat from thirteen bushels to thirty-seven, of barley from fifteen bushels to thirty, and so on. Chile's production of nitrate, 700,000 tons in 1880, reached a maximum of 3,300,000 tons in 1916. In value it represents about 80% of her total mineral output, and 80% of her total exports.

The deposits of sodium nitrate are found in the extreme northern part of the state. A combination of conditions, duplicated, so far as is known, nowhere else in the world, has brought about the accumulation of nitrate salts, layer upon layer, over an area possibly 75,000 square miles. The actual origin of the deposits is not well understood, but it is probable that the salts are carried down in solution from the near-by Andes by the ground water which is found a few feet below the surface. The water flows across the plain, that slopes gently down from the foot of the Andes toward the coastal range. At this point it is cut off from the sea, but does not form a lake, so speedy is evaporation due to the extreme dryness of the air in this region. The salt is left behind as a precipitate. That it does not redissolve is due to the absence of rain. If indeed at any time the height of the Andes were to be reduced so that the prevailing easterly winds should no longer be forced to deposit their moisture upon the Atlantic side of the mountains, or if the Humboldt Current in the Pacific were to change its course and no longer cool the westerly winds to land temperature so that, instead of fogs, their moisture were precipitated in rain, Chile's wealth of nitrate salts would speedily vanish in solution.

Two provinces, Tarapaca and Antofagasta, produce most of the nitrate. Only 2250 square miles of the possible 75,000 have as yet been surveyed, but it is estimated that the total reserves amount to about 700 million tons. Less than one tenth has been removed since the first shipment a century ago, and at the present rate of export the supply may last for two or three hundred years longer.

Originally these two provinces belonged to Peru and Bolivia. The boundary lines were very indefinitely drawn, and it was Chilean enterprise and capital that were responsible for the exploitation of the deposits. Frequent disputes arose between the countries. Active hostilities between Chile and Bolivia were prevented by a definite boundary agreement (1874) and the promise on Bolivia's part not to increase taxes levied upon Chilean citizens or capital located upon her side of the line. Unfortunately for herself, Bolivia failed to observe her agreement, and her intrigues with Peru, aiming to limit Chile's competition in the nitrate market, led to the war of 1879. Chile was victorious over her combined opponents, Bolivia and Peru, and by the peace treaty of 1884 obtained the two provinces of contention. Incidentally, Bolivia lost her only access to the sea.

Copper

Chile was the chief copper producing country of the world until the United States overtook her in 1883. After that her output declined to less than half what it had formerly been.* Her best superficial ores had become exhausted, and although her reserves are enormous — 38% of the total world's resources as compared with 34% of the United States — they carry less than 3% pure metal, too low grade, until recently, to be worth exploiting in the face of North American competition. In the last decade or so, however, two or three factors have combined to revive

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* See table on page 202.

Chile's prospects as a copper producer. Improvements in processes of ore concentration and smelting have made possible the utilization of lower grade ores than formerly — an advantage shared, to be sure, by the North American producers — and the opening of the Panama Canal has brought the country nearer to the great consuming markets and reduced expense items of freight, insurance, and interest during transportation.

Copper, it will be understood, occurs in vein deposits in fissures and crevices of rock, where vapors and gases from the interior of the earth have left a precipitate in their passage outward, or waters seeping downward from the surface have deposited dissolved material ("secondary enrichment"). Veins may be several feet in width or tiny hair-like threads; they may occur as single lenticular masses, or, like dried mud cracks, close together and all criss-cross; they may be composed of two or three relatively pure minerals or of a number closely intermingled — lead, zinc, iron, silver, cobalt, occasionally gold or platinum. The problem has always been, of course, to separate, first, the metal content from the useless rock or "gangue," and second, to dissociate each

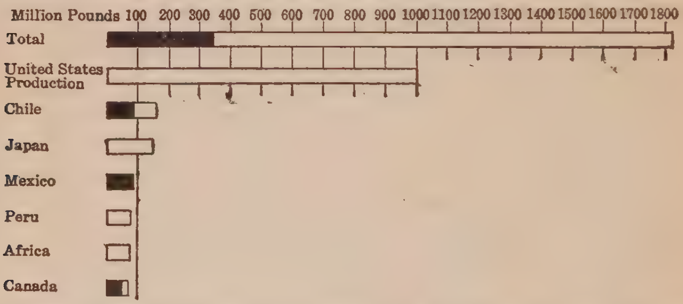

FIG. 33. Copper-producing Countries of the World, and United States Copper Imports.

(Showing the total output and the output of each country, average annual, 1919/21; and the portion imported by the United States, in black.)

metal from the others. The processes involved are (1) "concentration" to reduce as far as may be the proportion of the gangue, (2) "roasting," "smelting," and "converting" to eliminate arsenic, sulphur, iron, and the remaining gangue, and (3) "refining," to obtain each metal pure.

The first improvement in method which has so signally brightened Chile's prospects has been in the process of "concentration." Herodotus recounted in his "Melpomene" how the maidens of the island of Cyraunis used to collect gold by smearing feathers with bitumen,* and rubbing them in the wet sands on the borders of a lake. Particles of gold hidden in the sand would stick to the feathers, but the sand itself fell away. Although it has long been known that oil has this peculiar selective attraction for metals, centuries elapsed from the time of Herodotus until the practical application of the principle in 1897 to modern methods of mining.

It is thought that the affinity of oil for metals may be connected with the presence of gases contained in them. These gases also tend to make metal particles float — a tendency which is assisted by oil (1) by its preventing the escape of the gases inside each particle, (2) by the fact that oil itself is lighter than water, and (3) by further entangling and retaining free gases. It is a matter of common observation that bubbles of air in water seem eager to cling to any solid object. Drop a grape in aërated water and the clustering bubbles will shortly float it to the surface. Certain acids dissolved in the water counteract this tendency so far as siliceous material or gangue is concerned, so that all the bubbles seek only the metal particles.

In short, the new process, or "flotation" process as it is called, consists of reducing the ore to a very fine silt or "slime," mixing in a little oil and proper acids, passing this "pulp" into receptacles filled with water which is so continually agitated as to be kept thoroughly aërated, and skimming off the froth of metal particles floated to the surface by the clinging air bubbles.

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* Herodotus himself used the word "pissa," meaning "pitch," but in concluding his narrative (Book IV, Melpomene, 195), he writes, "if this be true, I know not . . . it may be even so, however, since I myself have seen 'pitch' (pissa) *drawn up out of the water*." The inference is obvious. "Pissasphaltos" is the ordinary Greek word for bitumen or mineral tar.

The "gravity" process hitherto in use is nothing more nor less than the pioneer's primitive "panning," improved by large equipment and power machinery. The pioneer gold prospector used a pan which he partly filled with "pay dirt." By holding it under a stream of water and constantly shaking and twisting the pan, he kept the gravel and sand suspended in the water. The lighter grains were carried away in the current, leaving behind the heavier or gold-bearing particles.

In the modern plant "jigs" and "Wilfley tables" were used. In the former, pulsations of the water are supplied mechanically by a plunger that keeps the ore loosened and partially suspended in the stream. The metallic "concentrates" sink to the bottom and are drawn off through a trap gate; the "middling" flows over the end of the jig. The Wilfley table has a mechanism that jerks the ore material forward. The heavier material moves with greater momentum than the middling and so settles beyond it in the "riffles" placed to guide it to the end. Wash water, injected at right angles to the jerking motion, carries the middling over the lower edge of the table. Large plants equipped with these machines can handle several thousand tons of ore in a day, as compared with one ton of placer dirt washed by a single man in a ten-hour day; and the cost under favorable circumstances may be as low as three cents per cubic yard (less than two cents a ton). But even in the up-to-date gravity plants there is a waste in the "tailings" of 15 to 20% of the recoverable metal content. By the flotation method three quarters of this is saved.

The flotation process requires subdivision of ore particles to something less than three thousandths of an inch in diameter. Such fine particles are too light to separate effectively by gravity, and waste occurs. But waste also occurs in the other direction, in coarse subdivision, for the larger the particle, the less possible is it to release all the metal content from the gangue. Before the adoption of flotation, some of the tailings going to the dump were six hundredths of an inch in diameter — three times the diameter, nine times the volume, of the coarsest particles now sent to waste. Jigs and tables are still used in the best plants, but they serve chiefly as "pilots" or barometers to guide in regulating flotation operations.

The adoption of the flotation process of concentration has promoted other economies, particularly in smelting, which will be of interest to Chile. The reverberatory furnace is better adapted to take finely divided material than the blast furnace. The latter is a huge retort with a thick silica or "acid" lining. The charge of ore is poured in directly upon the fuel. A strong blast of air forced up through holes (tuyères) in the bottom blows the fire to white heat, and smelts the charge. Part of the sulphur content is turned to sulphur dioxide, which passes off with other gases. Part of the iron sulphide content is also oxidized and thereupon combines with the silica of the lining to form ferrous silicate slag, and with the copper sulphide to form "matte," 40 to 50% pure copper.

The reverberatory furnace is a great brick chamber, perhaps 150 feet long and 20 feet wide. The charge is placed on the floor or hearth. The heat is received by radiation from a fire of long-flame bituminous coal kindled at one end (farthest from the flue) or of oil or pulverized coal sprayed directly above the charge. Proper proportions of silica, alumina, and lime to assist in fluxing the ore are introduced with the ore concentrate. The reaction is the same as in the blast furnace.

The blast furnace, it will be seen, is not adapted to finely divided material for the simple reason that the slime turns to dust and is blown out by the violent air-blast. Advantages of the reverberatory furnace are (1) that the removal of iron content is accomplished without sacrificing the lining of the furnace. The silica is supplied as part of the charge. (2) The desired reactions are obtained simply by heat: there are no complications due to the presence of carbon and oxygen. (3) While the blast furnace *must* have coke, and that strong enough to stand up under the tremendous load of ore resting upon it, the reverberatory furnace can employ bituminous coal, pulverized coal, or crude petroleum. The two latter are especially expedient in that they can be easily regulated. Oil required in one plant to smelt 666 tons of ore in twenty-four hours amounted to 421 barrels (about 85 tons) as compared with 124 tons of coal, or 8 tons of charge per ton of oil as compared with 5.4 tons of charge per ton of coal.

The advantages to Chile arising from the invention of the flotation process are not confined to the profitable exploitation of low grade ores or to the economies of the reverberatory furnace over the blast furnace. Chile's coal, as we shall note elsewhere,* is not suitable for coking. She is practically excluded from using the blast furnace for smelting, and would therefore have to ship her ores as concentrates, only 8% metallic content, instead of as matte, 40 or 50% pure. The possibility of using pulverized coal or petroleum afforded by the reverberatory furnace, however, may remove this serious obstacle. Whether her own coal pulverized is suitable, the writer is not informed, but oil is obtainable from points much nearer than any other coal supply — for instance, from northern coastal oil fields of Peru.

There is no apparent reason why the steps following the production of matte may not also be completed to advantage in Chile: the "conversion" of matte to "blister" copper, 95% pure, and the final refining to pure copper. The converter is a large cylinder topped by a truncated cone, through which it receives the charges and which serves as an outlet for gases. It is pivoted so that it can be tipped down to discharge the contents. Molten matte is poured in and air blown through as in the blast furnace, carrying the process of elimination of sulphur, etc., to completion, and leaving an alloy of copper with silver, gold, and other metals. No fuel is required, however, once the converter has been heated.

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* See page 209.

The blister copper from the converter may be cast in special molds in the form of "anodes" for electrolytic refining. Chile has ample hydro-electric power to serve this branch of industry. Electrolytic refining is nothing more nor less than electroplating. The cast of blister copper is attached to the positive pole of an electric power generator, a thin sheet of pure copper, the "cathode," to the negative pole. Both are immersed in a bath of copper sulphate solution (sulphuric acid, copper oxide, and water). As the electric current is turned on, the copper sulphate is decomposed into its constituents, sulphuric acid and copper oxide, and some of the water of the solution is decomposed into hydrogen and oxygen. The copper oxide is drawn to the negative pole, where its oxygen unites with the hydrogen element of the water just liberated, thus becoming water again, and its metallic copper is left as a deposit. The original oxygen element of the water, on the other hand, seeks the positive plate or anode. It unites with a particle of metallic copper and becomes copper oxide, which in turn combines with the sulphuric acid of the bath and thus completes the circle by becoming copper sulphate. The net result of the cycle is to deposit one particle of metallic copper upon the cathode and to remove one particle of copper from the anode. This is repeated until all the copper of the anode has been deposited upon the cathode. The other metal constituents of the original anode of blister copper, the nickel, cobalt, zinc, silver, gold, are left behind in solution or drop to the bottom of the tank, to be recovered subsequently by other metallurgical processes.

With her enormous copper deposits, found both in the coastal range and in the Andes from the northern boundary to the province of O'Higgins, south of Santiago, and with the chief obstacles to their economic exploitation removed, we may expect soon to see a notable increase in Chile's copper production. The United States produces two thirds to three quarters of the world's copper, and still exports seven to eight hundred million pounds, but we shall retain in the future a constantly increasing proportion of our copper for domestic use and for the manufacture of finished goods for export. The metal is essential for electrical equipment. During the War when the Allies controlled practically all the world's copper and Germany, after requisitioning every scrap she could lay hands upon, was forced to resort to substitutes, she found that in nearly every instance the substitutes were inferior or, for normal times, too expensive. In short, copper and copper alloys are indispensable for industry and for munitions of war. A supplementary supply of copper outside of our own country but under American financial control (seven eighths of Chile's output is produced by American companies) will be a most valuable asset.

Iron and Other Minerals

Chile is rich in iron ores as well as copper, but so little has been developed or even surveyed that neither the extent nor the character of the deposits is known. Lack of adequate transportation facilities, lack of fuel sufficiently near at hand, the entire absence of good coking coal, and the comparative ease of importation of iron and steel manufactures from countries endowed with all these factors, have until recently discouraged any elaborate attempts to exploit her iron resources. However, the opening of the Panama Canal has increased the importance of these ores by increasing their accessibility for American and European steel industries. The Bethlehem Steel Co. has acquired two large hills about four and a half miles from Coquimbo whose entire tops are composed of practically solid hematite, about 100 million tons, which can be simply quarried off the surface, and loaded on cars that run by gravity down an inclined railroad and shoot their freight directly into the holds of the waiting ships. Although the total deposits of Chile, perhaps 1.0 to 4.5 billion tons, are much smaller than Brazil's in Minas Geraes, they will be commercially important sooner because of their ready accessibility.

Other mineral deposits that deserve mention are borax — enough to supply the whole world for several centuries; common salt in vast deposits of unknown thickness throughout the arid northern zone; sulphur, lead, aluminum, manganese, nickel, coal, etc., etc. Iodine, almost the entire world's supply of which comes from Chile, is a by-product of the nitrate refining industry.

As a Market for American Manufactures

It is generally assumed, perhaps on the theory of the balance of trade, that the opening of the Panama Canal, which has made accessible the great mineral resources of Chile, has equally opened up a new market for commodities. The United States has been flooded with propaganda for the promotion for our export trade to Chile. Careful analysis of the prospects of this market, however, seem hardly to justify such radiant optimism as writers evince.

The total population of Chile is only 3.7 millions — about equal to that of Switzerland or of our own little state of Massachusetts. Two to three hundred thousand are Indians. A million to a million and a half live so simply that they do not enter the market at all. Their huts are of sun-dried mud with roofs of corn straw thatched over branches. An oven of clay, a bed of straw, a few primitive cooking utensils, a rough, home-made table and stools — the home is complete. Probably less than a million Chileans are of pure Spanish extraction, descendants of the conquistadores, and form the aristocracy or ruling class. The wealth and extravagance of this class will doubtless compensate somewhat for the limited number of purchasers. Chile's imports of textiles, wearing apparel, etc., per capita of her buying population, are two or three times as great in value as those of Argentina. This tendency toward the purchase of quality goods rather than medium-grade standardized articles makes Chile a market of less interest to us than to Europe.

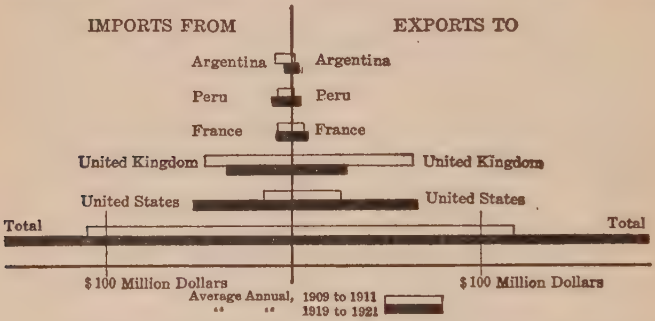

FIG. 34. Foreign Trade of Chile, Annual Average, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

Nor are the prospects of a rapid expansion of the market as bright as we have been led to suppose. The increase in purchasing power resulting from the exploitation of Chile's mineral resources is not quite as great as might appear from figures of her exports. A large proportion of her mining enterprises are financed by foreign capital. Interest, dividends, profits on this capital are sent out of the country in the form of exports, an *excess* of exports not balanced by an equal value of imports.

Mining employs too small a proportion of the population to have much appreciable effect upon the demand for consumers' goods. The entire population of the mineral provinces, Coquimbo, Atacama, Antofagasta, Tarapaca, and Tacna, amounts to only 520,000. Of the imports into the region, half consist of coal, petroleum, and lumber. The nitrate industry employs a total of about 50,000. The workmen are well paid and everything that is consumed in the nitrate region must be imported from outside; nothing is produced in the place itself. But to the "roto," good wages simply means more "aguardiente" (a brandy made from sugar cane). He works and saves only for his week-end or holiday carouse. If his pay were doubled, he could get drunk with only three days' work instead of six. As to his being able to support a larger family, already the birth rate is as high as nature permits. The only checks are those imposed by filth and disease.* As some one remarked, "they breed like germs and die like worms."

Indirectly, it may be said however, Chile's mining industry affords means of support for more people than those directly concerned. The tax imposed upon nitrate exports has proved so productive that the government has found it possible to reduce or entirely dispense with other methods of raising revenue. She has virtually levied a tribute upon purchasing countries amounting to as much as half the cost of the product delivered at the seaboard, and without any appreciable diminution of the amount bought. With such a source of revenue, safe from the protests of a vigilant public, Chile has been able to support an exceptionally large administrative bureaucracy. The aristocracy of Chile never go into business. They prefer politics, the army or the navy, "non-productive" lines of activity supported by state revenues. Unfortunately, wealth concentrated in the hands of an idle aristocracy tends to increase extravagance rather than to raise the birth rate. Instead of bringing about a broader consuming market, the tendency, as we have just noted, is toward expenditure for more expensive qualities and larger variety — a trend of more interest to European manufacturers than to the American producer.

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* The death rate in Santiago and Valparaiso is 70 per thousand, one of the highest in the world.

With her "easy" source of revenue, Chile has been able to embark upon extensive public improvements on a scale which in most countries would be considered impossible. Her elaborate system of railways extending from Tacna in the extreme north to Puerto Montt, two thirds of it under government ownership, is of great strategical value in protecting her vulnerable length, but the roads are commercially unimportant, and are being run at a heavy annual deficit. Expensive port and harbor improvements have been undertaken. With all her 2500 miles of coast line, Chile has only one or two good natural harbors — Talcahuano, Coronel, and perhaps Coquimbo. Valparaiso, which handles 75% of her import trade, is practically an open roadstead, exposed toward the north to terrific storms in winter. Other "harbors" are mere shallow indentations in the wall of mountains along the coast. Ships have to stand off shore sometimes a mile or more. Freight is discharged by lighters which range alongside, bobbing up and down as the steamer rolls and pitches in the heavy swell. Undoubtedly the improvement of her harbors will be a great economic advantage, for now much freight finds a resting place in the briny depths beyond reach of salvage, or is smashed beyond repair in the process of transshipment. The expense of making the improvements will be enormous on account of the great depth at which the foundations of breakwaters must be laid.

Instability of a Market Dependent upon Mining

Although Chile's mining industries thus indirectly open up a more extensive market for producers' goods, such as cement and construction materials, railway equipment and the like, and affords occupation for a larger labor force, it should be remembered that prosperity built upon mining is exceedingly unstable. The treasures of the earth are distributed according to Nature's caprice. What is supposed a rich lode may be found to be simply a pocket; or new sources may be discovered elsewhere that make the first impracticable to operate. Under adverse conditions the farmer can live off his farm, the manufacturer can "change over" to some other line of production; the miner has no choice but to shut down. What today is a flourishing mining city is tomorrow deserted as if swept by pestilence.

When the War first cut off the market for her nitrates, Chile's entire laboring force in the nitrate fields was brought face to face with starvation. The price of nitrate fell nearly 30%. Exports for the months from August to December, 1914, dropped to a third the quantity exported during the same period of 1913; production was cut in half. Instant action was necessary. The government returned the Bolivian and Peruvian immigrants to their homes, and transported 30,000 laborers from the nitrate fields to the agricultural provinces. This sudden influx of labor, in its turn, worked hardship upon farm labor — at least to such extent as the miners would work for the low wages offered. Many of the miners, who are the least adaptable and most restless element of Chile's laboring population, refused to work for so little compensation and had to be supported by the government. It was fortunate, indeed, for Chile that the stagnation of demand for her nitrates was of short duration, and the number of persons directly affected relatively few. What might have happened otherwise can readily be appreciated.

Chile enjoys a monopoly of natural nitrates, but the world is not without substitute sources. Nitrogen for fertilizer is recovered from organic sources — garbage, sewage, offal from the slaughterhouse, cottonseed meal, etc. It has been estimated (1913) that fully as much commercial fertilizer consumed in the United States is made from these organic materials as from nitrate of soda. Taking into account the supply that never reaches the market but is utilized in its own locality, the organic nitrogen used in the world must be about as much as all other nitrogen compounds put together, almost double Chile's sodium nitrate.

Next in importance to the organic sources are the ammonium sulphates, by-products of the coke oven and oil shales. Consumption of these at present amounts to about two thirds of sodium nitrate, but the trend of modern progress toward centralized coördination in the coke industry — the furnishing of gaslight and power to cities by single integrated plants, with by-product recovery possible on a commercial scale — points definitely to a steady increase in the relative importance of this source.

The greatest of all sources of nitrogen supply is the air. Four fifths of the atmosphere enveloping the earth is composed of "free" nitrogen, nitrogen in a gaseous state. Before it can be utilized, however, it must be brought into combination and held or "fixed" with some solid material capable of being handled and applied to definite locations. The War greatly increased the use of fertilizers to obtain heavier food crops with the minimum expenditure of labor. Requirements of nitrogen for refrigeration in order to transport perishable foodstuffs overseas still further increased the demand. And nitrogen is essential in the manufacture of ammunition. The pressure of the demand resulted in the immediate development of various methods of "fixation" of atmospheric nitrogen. The Muscle Shoals plant was built to produce nitrate by the cyanamid process of fixation.

Germany, her sodium supply completely cut off, developed the Haber process. Norway utilized her abundant hydroelectric power for direct oxidation, or fixation by combining oxygen and nitrogen by passing a mixture of the two gases through an electric arc.

So far, all three methods of fixation, while demonstrating our potential independence of Chile, have been of uncertain economic significance. The cyanamid and the arc processes require so much electric power as to be prohibitive under normal conditions, and the Haber process apparently calls for such careful and skilled attention that it is incompatible with mechanical volume production.

Chilean nitrates have never pretended to be able to compete with the by-product compounds derived from organic residuum or from coal and petroleum. The supply of these, however, is determined, not by the requirements for nitrates, but by the market for the major products, meat, gas, etc., and by the stage of industrial development attained in their process of production. The real field of competition is between Chilean nitrates and the fixation compounds. But the fixation compounds are costly to manufacture, and Chile has a wide margin for the reduction of her prices by lowering her export tax and improving her methods of production. Under normal economic conditions there seems to be no possibility of the complete displacement of Chile's product. Nevertheless, in this war-crazed world of ours, some governments may feel it advisable to subsidize fixation plants, even at an economic loss, in order to maintain their military independence.

The true significance of the substitutes is that they set a definite limit to the quantity demanded and price of Chile's nitrate, and consequently a limit upon her government revenues from this source — thus indirectly, upon the number of people that can be supported by her nitrate industry. If she produces too much for the world market, the price will be reduced and the profit curtailed. If she tries to raise her price or increase her export tax beyond a certain point, the fixation compounds will enter the field. In any case, an increasing proportion of the world's requirements will doubtless be met by the by-product compounds, so that she cannot even count upon a development of her industry in proportion to the expansion of the world market.

Chile has already experienced some of the uncertainties of prosperity based upon mining. Less than fifty years ago, she was the foremost copper mining country of the world. In 1879, the United States produced less than half Chile's output; in 1883 we exceeded her by 25%; in 1885 we were nearly double; in 1888 we produced over three times her output (and double our own figure for 1883); in 1891, over six times her output.

Production of Copper in Chile and the United States

	CHILE	UNITED STATES
1879	49,000 tons	23,000 tons
1880	43,000	25,000
1881	38,000	31,000
1882	43,000	41,000
1883	41,000	52,000
1884	42,000	65,000
1885	38,500	74,000
1886	35,000	70,000
1887	29,000	79,000
1888	31,000	102,000
1889	24,000	106,000
1890	26,000	116,000
1891	20,000	124,000

The appalling irregularity of mining may be appreciated from figures of our own production in the last few years:

1918	1,100,000 tons
1919	880,000
1920	605,000
1921	253,000

Although mining affords Chile the larger part of her revenue and purchasing power, and is the field of greatest commercial interest to the United States, agriculture employs most of the people and the domestic capital. Only 56% of the total population lives outside of the cities, but many of the city dwellers are owners of "haciendas." Prior to the annexation of the nitrate provinces, agriculture was practically the exclusive interest of the Chileans. It is still the backbone of the nation. Some attention to this field of livelihood is certainly necessary, then, before we can determine the prospects of Chile as a market for American manufactures.

Prospects of Development in Agriculture, Lumbering, and Manufactures

Crops raised are chiefly cereals and fruits of the temperate zone. Almost a third of the area cultivated is sown to wheat. Various subtropical fruits abound, such as oranges and lemons. Her vineyards are extensive, and Chilean wines have quite a wide reputation. The potato, according to Darwin, originated in Chile. Cattle raising is of importance, though after visiting Argentina, with its thirty million head, (or 350 per hundred persons), or Uruguay with 520 head per hundred persons (110 head per square mile), one is not much impressed by Chile's two million odd: 58 head per hundred persons or 7 per square mile. Sheep raising is making progress in Tierra del Fuego, but her total of 4.5 million seems a paltry number beside Argentina's vast flocks ten times as numerous: Chile with 120 head sheep per hundred persons to Argentina's 520, or 12 sheep per square mile to Argentina's 40. Koebel puts it rather too mildly when he says that Chile is "just a little overshadowed" by her sister republic.

The room available for expansion of agriculture is very limited. Out of a total superficial area of 290,000 square miles, only a quarter, 65,000 square miles, is even suitable for agriculture. This land is almost wholly in the central portion of Chile. The entire country stretches along the western coast of South America like a narrow ribbon more than 2500 miles long and 100 to 200 miles wide — as if one were to pin a corner of Texas to New York City and stretch it out across the continent to San Francisco. The northern end is arid, ill-suited to agricultural development, especially

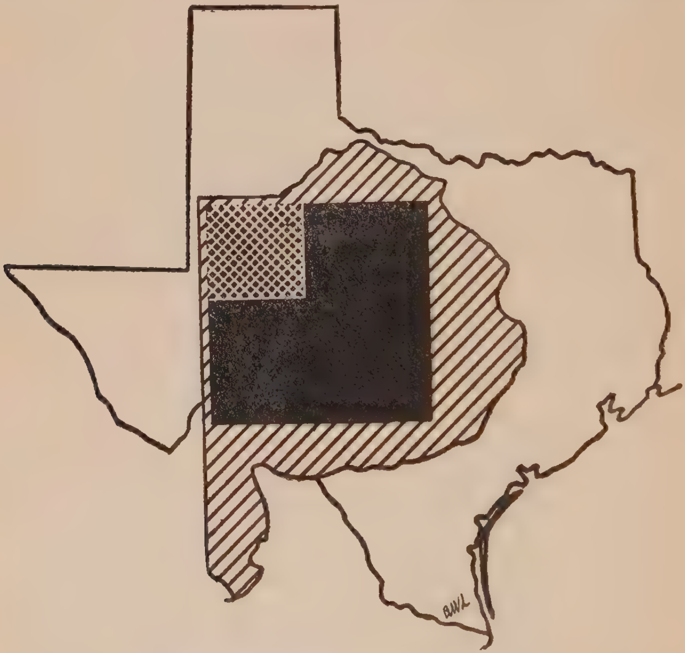

FIG. 35. Agricultural Area of Chile.

(Showing the total arable area as a square — the portion actually under cultivation, cross-hatched with white lines — super-imposed upon the Province of Buenos Aires, Argentina, and Texas, U. S. A.)

in the rainless deserts of the nitrate region. The southern end of the ribbon, from Valdivia to Tierra del Fuego, is too cold,* wet and disagreeable, too densely forested, or too broken up into small islands, to be available for farming on a large scale. These two zones together comprise two thirds to three quarters of Chile's total area. The agricultural zone itself is further reduced by the lofty Andes on the eastern border and the coastal range on the west. Only the narrow valley between, thirty-five to forty miles wide, is left. This, then, is the real Chile. In provinces of the agricultural zone, comprising a fifth of her area, live four fifths of the population (average density, 37 persons per square mile). In the provinces of Valparaiso, Santiago, and O'Higgins, 3.4% of the area, is concentrated almost a third of Chile's population. Here is situated, fifty miles inland,

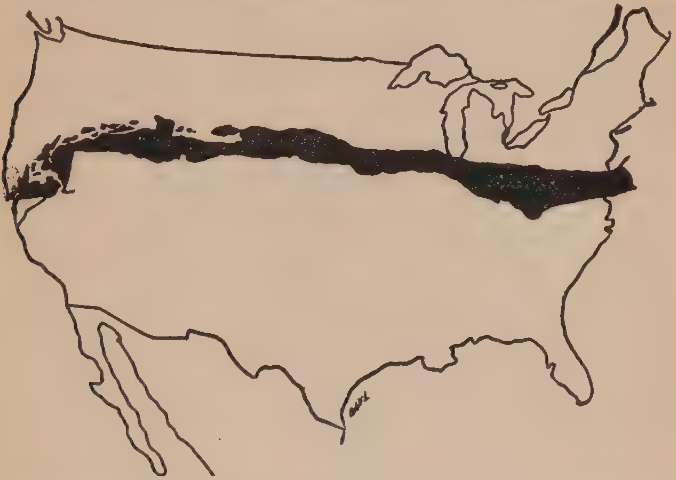

Fig. 36. Area and Shape of Chile.
(Shown by super-imposing Chile horizontally upon the United States.)

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* The name of Chile was probably derived from "tchili," snow, or "chiri," cold.

1800 feet above sea level, the beautiful capital of the nation, Santiago, with its lovely setting of lofty snow-capped mountains.

Even of the comparatively limited area suitable for agriculture only a fifth, 12,000 square miles, is actually under cultivation, so that there is still room for expansion. A population of almost twenty millions might be supported without any change to more intensive methods of farming. Unfortunately the probability of any such expansion in the near future is very slight. No free or cheap agricultural land is left, as in Brazil and Argentina. The country was long ago divided up among the original conquerors, who received grants of large estates in reward for their services in battle. These estates remain in the hands of their descendants. The evil of latifundia is relatively almost as serious as in Argentina, although in Chile holdings are seldom larger than ten square miles — to be compared with 100 or even 200 square miles in Argentina.

Small hope is there for a man to work his way up from the position of a farm laborer to that of an independent farmer or for an immigrant to acquire land. The terms of leasehold belong to feudalism of the middle ages. Labor is kept in a state of complete economic dependence. The laborer receives his squalid housing on terms of six months or a year, a daily ration of one to two pounds of beans, and a money allowance of twenty to forty cents. The owner has no special interest in caring for the house, and certainly the tenant has even less concern for its upkeep. Under such conditions it is natural enough that thousands of agricultural laborers should emigrate to Argentina (ten days' journey on foot), where wages are twice as high, rather than that immigrants should enter Chile or workers be attracted from other occupations to swell the agricultural population.

Latifundia in itself does not necessarily prevent agricultural expansion. Argentina has sufficiently proved this.

But the incentive to progress in Argentina's case has been supplied by the increasing demand of Europe for foodstuffs. This stimulus, however, can scarcely reach Chile until the more readily accessible, superior, and vastly more extensive tracts of Argentina and Brazil have been much more fully exploited. Any appreciable increase in the demand for Chile's agricultural products will have to come from within; that is, from an increase in the consuming population. Any increase in the consuming population must be looked for, if not in agriculture itself, and if not in mining, then in the only remaining occupations of lumbering or of manufacturing.

Lumbering, like mining, supports a relatively small number of people. It is a frontier occupation. Moreover, although Chile is densely forested in her lumber zone (which comprises over 80% of her entire forested area), only a twentieth part of the growth is commercially suitable for lumber. There is perhaps as much again north of Concepción, but altogether there are only something over three million acres of commercial timberlands. The prospects are rather for an increased dependence (now 50%) upon imported lumber. The total requirements of the country are only about 80 million board feet, or one third the lumber production of the state of Massachusetts in 1910. Since in Massachusetts only about 10,000 persons were employed, we need hardly consider further the possibilities of lumber production as a field for expansion of population in Chile.

The remaining possibility, then, is manufacturing. Chile might use her own mineral resources for the manufacture of the finished articles she needs, instead of exporting the raw materials and importing the manufactures. Her climate is ideal for the regular, continuous work of the factory; her labor, though ignorant and of a low standard of life, is not unintelligent, is physically strong, and works well when not drunk. Wage cost is low. As a nation Chile has more energy and initiative than any of the other South American countries. She has coal near tidewater, accessible for transportation — so near, in fact, that in the Lota mines near Concepción it is said one can hear the ships coming to anchor overhead; the mine galleries penetrate dense strata of slate and shale beneath the water itself. And lastly, she has splendid possibilities for the development of electrical power. Her rivers are short and not navigable to any extent, but they descend from the high Andes Mountains, dropping abruptly to the sea in such a short distance that the power available for development is very great. Already a project is on foot to link up a number of generating plants into a single longitudinal transmission system for supplying power throughout the length of the state. It is estimated that Chile has a potential capacity of two million horse power, of which only 60,000 h.p. has been developed hitherto.

Indeed Chile's manufactures already appear to be considerable: a total capital investment (1913) of about $100 million or $30 per capita, as compared with Brazil's $160 million or only $7 per capita; employment is given to 80,000 workers, using 65,000 primary horse power (chiefly steam and water; electrical development noted above is utilized for public service enterprise). The value of the total output reaches $125 million. She has chemical works, wool and cotton textile mills, factories for hosiery, underwear, furniture, paper; foundries, even machinery works and locomotive repair shops. "With additional capital," writes W. A. Tucker, "Chile would soon be practically independent of other sources of supply for nearly all its manufactures." "Those who have eyes to see," exclaims F. J. G. Maitland, "cannot doubt that in the very near future Chile will be the workshop of South America."

Mr. Maitland may be right in his prediction. Nevertheless there are some grounds for question. Each favorable factor we have presented above requires qualification of one sort or another. The climate is *too* ideal; subsistence, too easy. It is difficult to obtain a steady supply of labor and to keep it once it is trained. The United States has encountered somewhat similar difficulties in trying to establish industries in the South. The "roto" may be docile and have a certain amount of natural intelligence, but he is without ambition, is of a nomadic disposition and has no aptitude for education. He works well *when* he works, but his irregularity imposes a serious handicap upon any form of manufacturing, and there is little inducement to establish a factory for making articles that require any degree of skill. No relief can be expected from immigration, for that is negligible. The opportunities of the country are not such as to attract the immigrant. The government even goes so far as to forbid immigration except under special contract — an attitude quite the reverse of Brazil's. The only hope lies in the improvement of the standard of living, and that is a very slow process indeed, especially slow in Chile since there are strong interests of the aristocratic class opposed to such improvement.

Chile's natural interests, the initiative and energy of her best men, run in directions other than manufacturing. Industrial enterprise will have to be promoted by foreigners. Perhaps eventually a certain amount of respectability might become attached to industrial activity sufficient to attract the upper class, but business is naturally and proverbially distasteful to the Spaniard. Such a change would be fundamental and would doubtless be long in coming to pass. To expect a nation to become prominent in manufacturing while its best elements shun industry and its working class does not afford a stable labor supply, would seem quite unreasonable.

The coal resources of Chile are not of first grade. In spite of efforts to encourage the consumption of the domestic product, she still relies upon foreign sources for half the coal she uses. She has none suitable for coking. To develop a steel industry she must either make her coke from imported coking coal, or she must import the coke itself. The first would be impracticable for want of a broad enough market for the by-products, gas, tar, ammonia, etc., that help to reduce the average cost. The second would be impossible on account of the cargo space required — more than double that per ton of coal. Chile will undoubtedly develop her hydro-electric resources considerably in the future. It must be remembered, however, that the initial outlay is very heavy. For certain purposes, *e.g.*, copper smelting, such outlay will pay, but for general manufacturing, which supplies a market so restricted, it is of questionable expediency.

The present extent of her industrial development cannot be taken as an indication of future progress. Her remote situation in the world tended to stimulate domestic industry. High-grade articles that could bear the cost of transportation she was able to import, but for cheap goods she was forced to rely upon home production. The Panama Canal has been of less benefit to trade in manufactures than to trade in raw materials. Manufactures are less bulky in proportion to their value and consequently the cost of carriage overland across the Isthmus was less. That is, the barrier of the Isthmus was not so serious for manufactured goods as for raw materials, and by the same token, the removal of the barrier by opening the Panama Canal has not been of so great advantage. Nevertheless, it does permit the import of somewhat cheaper goods, owing to the lower cost of all-water carriage; we may expect to see, therefore, a slowing down rather than a more rapid development of industrial enterprise — unless, of course, the tariff is raised still further to compensate for the difference in freight.

Although the total figures relating to Chile's industries are somewhat impressive, inspection reveals that her industrial establishments are scattered, small in size, and turn out in general only the cheapest possible goods. The average number of employees is ten; the power used per hundred workers is about 80 h.p. (compare the United States, 273 h.p.). The average value of the output per establishment is $16,700 per annum. The most important industry, glass and pottery, produces an average of $90,000 a year per establishment; textiles, $71,000; gas and electrical plants, $52,000. Her total industry does not approximate that of Rhode Island, our smallest state, in 1914; her capital investment is a third that of Rhode Island; the number of employees, two thirds; the power, less than a quarter; the value of the product, less than half.

In short, our analysis of the economic bases of population increase in Chile — mining, agriculture, lumbering, and manufacturing — leads us to conclusions that fail to bear out the enthusiastic optimism of writers who are particularly interested in the promotion of our trade with Chile. Indeed, one is almost led to suspect that unconsciously they may have been influenced by the characteristic hospitality and warm friendship of their hosts, instead of basing their ideas upon a cold, dispassionate review of all the facts. Agriculture offers no immediate promise of expansion. Lumbering and sheep raising are frontier industries. Manufacturing is unsuited to the temperament and habits of the people, high or low, and may be expected to decline relatively rather than increase. Mining offers the best prospects for the future. A large share of the mining profits, however, is exported and is thus not available for supporting the population in Chile. The government expends part of the revenue it derives for the construction of railways, harbor improvements, etc., thus giving occupation to labor, but the greater portion goes to support an overweighted bureaucracy, military establishment, and idle aristocracy. It is ultimately spent upon luxuries and easy living, instead of being used for the improvement of the laboring class and the support of a middle class.

Attractiveness as a Field for Investment

Our chief interest in Chile is less in trade than in investment. It is from this point of view, the attractiveness of Chile as a field for investment, that we may conclude our study.

Investments in Chilean enterprise have yielded relatively larger returns than those in any other South American republic. Given a profitable field, the question remains, however, whether the country itself is politically and financially stable. Politically, no country in South America enjoys a better reputation. She is the only one that has had but a single revolution (in 1851) since her struggle for liberty and the establishment of the republic in 1810–18. In the civil strife in 1890, a contention for power between Congress and the President, so eager were the contestants to maintain the integrity of their country that both assumed the obligation of paying the government's creditors.

Chile's long seacoast has forced her to build a strong navy, which she has patterned after the British Navy. She is the only seafaring nation of South America. Her army, with its compulsory service, etc., is built upon the Prussian model. Thus she is powerful both on land and sea. As descendants of the Spanish conquistadors and the unconquerable Araucanians — impetuous, courageous, dogged — the Chileans are born fighters.

For some countries, such characteristics might be a menace to prospects of peace, as we have witnessed in Europe. Unlike Prussia, however, Chile has no direction in which she could expand. Political control straddling the Andes, whose lowest passes are 13,000 feet above sea level, would be but an apology for government. Expansion northward would simply exaggerate her present unwieldy shape. Though her attitude is perforce pacific, her power gives prestige that places her upon an equal footing with the immensely larger states of Argentina and Brazil. She is not a country to be lightly provoked. This is a decided element of safety, of course, for investors, for her rich mineral resources might otherwise be looked upon as a possible prize for aggression.

Financially, her position is not quite so satisfactory. Her foreign indebtedness amounts to about $170 million, or $45 per capita, to be compared with Brazil's $36. Her interest and sinking fund obligations are over $4 per capita.

More unsatisfactory still is the state of her currency. In 1898 the Chilean paper peso was made inconvertible. Ever since its value has fluctuated widely in response to the numerous factors underlying foreign exchange. This constantly changing value of the paper peso has been a handicap in trade, where dealings cover a few months at most and the risk can be offset by "hedging." It is a still more serious discouragement to investment. The investor ties up his money for a long period, and may thus find his entire profits swept away by a falling exchange due to factors over which he has not the slightest control. The paper peso fell from its par value of 36.5¢ to less than 20¢ in 1908 and, assisted by occasional new issues, to 15¢ at times during the War. The exchange value at the moment of writing is 11 cents.

Although redemption of her paper currency has constantly been urged and could easily be accomplished, efforts in this direction have been checked by one thing and another: the great earthquake of 1906; arrangements for the construction of public works in 1908; the European War; but especially by a strong, though concealed, opposition on the part of the landowners and exporting interests. A depreciating value means a relatively lower labor cost, for while the wage rate remains nominally the same, commodity prices immediately rise. The landowner pockets the difference as profit. The exporter, who sells his goods abroad for gold, but pays his labor in depreciated paper, benefits even more.

Finally, we must not forget that the welfare of a country so dependent upon mining enterprise, and upon a single product, as Chile has been upon nitrates, is exceedingly insecure. The discovery, let us say, of a cheap process for the fixation of nitrogen would plunge the country into bankruptcy. The variety of her other resources can be considered as a reserve to fall back upon only so far as they are commercially available to the world.

From such considerations we are led to conclude that, while our chief interest in Chile is as a field for investment, she is less attractive to the small investor than to the large concern that can acquire extensive mineral concessions and exploit them more or less independently of conditions in the country itself.

CHAPTER VIII

THE WEST INDIES

Political instability is the central feature of the countries of "Middle America." Population and trade are greatest where stability is most assured. Cuba's Cane Sugar production has enjoyed phenomenal expansion since her arrangement with the United States, which insured her political stability and permitted the introduction of capitalistic enterprise. Progress may be expected in other lines of agriculture and in iron mining. The reflection of her prosperity is seen in her import trade. The United States is favorably situated, but caution is advisable owing to Cuba's dependence upon a single product. Intervention by the United States has thrown open the virgin resources of Santo Domingo. The application of the latest methods of production promises her speedy development, and the introduction of internal improvements offers a growing market. Improvement of Haiti is problematical. Porto Rico, though benefited by her connection with the United States, has been handicapped by overdevelopment in the wrong direction.

The Caribbean Region

The outstanding problem of the entire region of "Middle America" — the countries lying between the United States and the equator — is their political instability. The future of our foreign trade and our investments in these countries, perhaps throughout the length and breadth of Latin America, will be determined in large measure by the policy the United States may adopt with reference to this characteristic.

In climate, resources, and products, the countries are very closely similar, but striking contrasts appear in regard to their economic prosperity. The cause of these differences is to be found in their degree of political stability. The West Indian Islands, Cuba, Haiti, and Porto Rico, afford examples at various stages of the material benefits derived from stability; the Central American republics and Mexico stand at the opposite extreme. The northern or equatorial states of South America are intermediate, and, for our purpose, do not require particular attention.

The area of the region, excluding the South American countries, is over a million square miles — approximately the same as that of Argentina. The largest state, Mexico, is 767,000 square miles in area. Most of the islands of the West Indies and British Honduras in Central America are dependencies belonging to Great Britain, France, and the United States. (Our possessions are Porto Rico and the Virgin Islands — until 1917, the Danish West Indies.) They aggregate 20,000 square miles. The remaining area, slightly larger than Texas, is split up among nine independent states, the six Central American republics, and Cuba, Haiti, and Santo Domingo — the last three technically independent, though under the "protection" of the United States. The largest state, Nicaragua, is under 50,000 square miles, or the size of New York; the smallest, Salvador, 8170 square miles, is the size of Massachusetts, two thirds of the area of Belgium.

The aggregate population of the region is more than three times that of Argentina, some thirty millions. Density of population is greatest on the islands. There, in less than a tenth of the area, over a quarter of the inhabitants are concentrated. The average density of population in the West Indies is 96 persons per square mile; Mexico, the least thickly settled, has an average population density of 20 per square mile, as compared with 7.9 per square mile in Argentina. For the Central American republics, the average density is 28 per square mile. (The average population density of the United States is 35.5.)

The total trade of the region, as we might expect from the large population, as well as the proximity to markets, is considerably greater than that of Argentina. In 1910, it

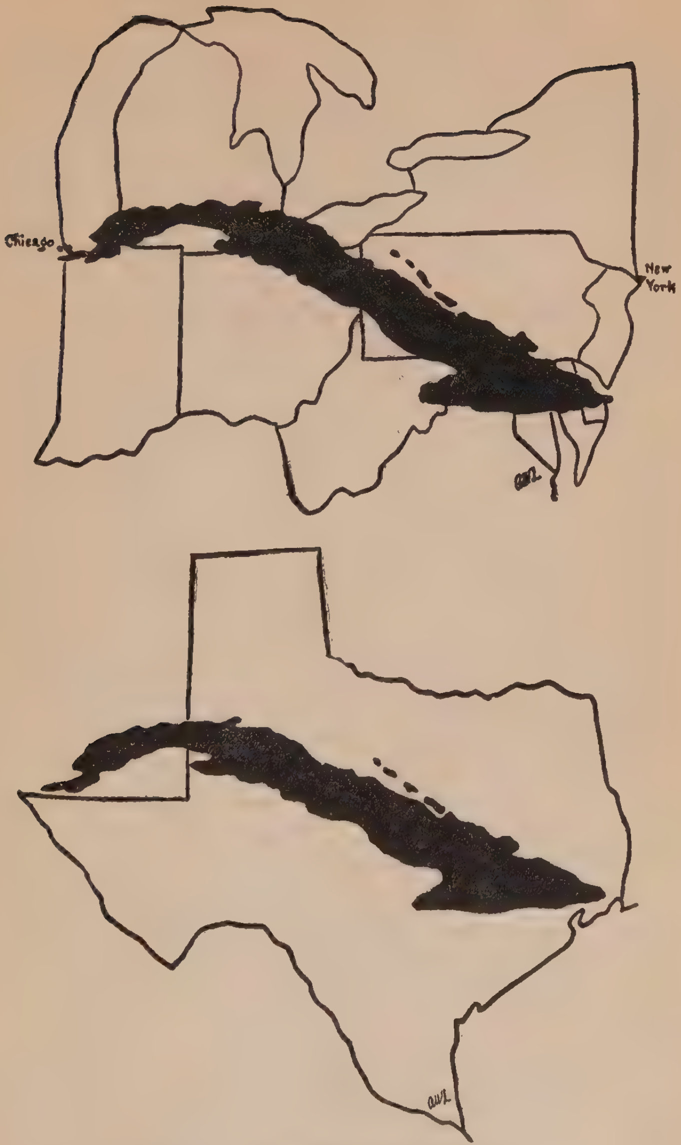

FIG. 37. Length and Area of Cuba.
(Comparison with eastern states and with Texas.)

amounted to $740 million as compared with $682 million for Argentina; in 1920, $2128 million to Argentina's $1796 million. The average per capita figure, however, was a third as much in 1920 — $70 to Argentina's $210. The distribution of trade is very unequal throughout the region.

Comparisons of Per Capita Trade

	1910	1920
West Indies	$47.00	$176.00
Central America	13.40	27.00
Mexico	16.40	24.60
Argentina	85.00	210.00
Brazil	21.00	38.00
Chile	65.00	120.00

The per capita trade, it may be seen, is greater for the West Indies than for Mexico and Central America, and the increase from 1910 to 1920 has been more rapid. For this, Cuba has been chiefly responsible. Without including Cuba's trade, the per capita for the remaining islands amounted to only $22 in 1910 and less than $26 in 1920. Cuba's trade was $118 per capita in 1910 and $445 in 1920.

With regard to the importance of the region to the United States, our trade with the Caribbean countries exceeds our trade with all the countries of South America put together — in the triennium 1919/21, 33% greater; four times our trade with Argentina. Cuba again stands out in contrast to the other states. Our trade with Cuba alone represents 57% of that with the whole Caribbean region (76% of our South American trade, and two and a half times that with Argentina).

The reason for Cuba's preponderance, as we shall see, is to be found, not so much in any superiority of resources, as simply in her political stability. We have in Cuba an exception to the general rule of anarchy and political debauchery characteristic of most of the region. Her prosperity is a concrete indication of the vast possibilities lying dormant here. If the other states could be brought to an equal degree of soundness, our trade with the Caribbean region, at no higher per capita figure than Cuba's, would exceed our commerce with all the rest of the world!

CUBA

Political Stability

From the time of her discovery by Christopher Columbus on October 28, 1492, until her successful revolt in 1895/98, Cuba was a possession of Spain. Like most countries under Spanish domination, she was the scene of constant turmoil and uprising. During the last century, insurrection marked the years 1823, 1826, 1828, 1830, 1848, 1850, 1851, 1855; the ten years from 1868 to 1878; 1881, and, finally, 1895 — the last being the occasion of armed intervention by the United States, resulting in the independence of Cuba in 1898. Her political conditions as a Spanish colony compare with those of the independent countries of the region — possibly not quite as bad, but bad enough.

For three years after the Peace of December 10, 1898, the United States maintained control over Cuba while she put her affairs in order and framed her constitution. This was adopted in 1901, including special provisions aiming to protect her from her own inexperience in self-government, namely, that she should enter into no treaty agreement endangering her independence, or contract indebtedness greater than her ability to pay. With a view to insuring observance of these provisions, the United States was to retain the right of intervention.* In other words, Cuba obtained her freedom *for good government*, but was insured against bad government by the full power of the United States. The wisdom of this arrangement was evidenced at the time of the attempted insurrection of 1906. Cuba has obtained that political stability that is so grievously lacking in most of the other Caribbean states.

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* In addition, we obtained the use of certain naval stations.

At the time of her successful revolt, Cuba supported something over a million and a half inhabitants, an average population density over her area of 44,000 square miles of about 35 per square mile. In twenty years (1899 to 1919) her population has well-nigh doubled.* Compared with her growth from 1841 to 1899, this is twice the percentage increase in a third the time.

Development of the Cane Sugar Industry

Cane sugar is the mainstay of the country. The cultivation of sugar cane in Cuba goes back to the time of Columbus, who is said to have introduced it from Spain, the Spaniards having received it from the Moors. Originally it was grown in India, at least as far back as 500 B.C. Alexander the Great brought some home with him to Europe. According to Indian mythology it was one of the few luxuries that was left for mortals when the temporary paradise created by the hermit Vishva was demolished.

Although the use of sugar thus goes back to remote antiquity consumption by peoples in cool climates has increased most markedly only during the past century. In sixty years the world's consumption multiplied more than ten times. Probably sugar is being used so extensively because of its energy-sustaining properties. It consists entirely of carbohydrate, which acts for our bodies like fuel. It is the only food that is 100% digestible and almost instantaneously digestible at that. Sugar is thus eminently adapted to the strenuous living conditions imposed by modern industrialism.

The United States is the greatest sugar-consuming country in the world, taking 20 to 30% of the total world's production. A hundred years ago we used about eight or nine pounds per capita. Today we consume per annum 80 to 90 pounds per capita. It is our chief article of import, amounting to 10% of the total value of all the commodities brought into this country. In 1920, when the import price rose to double that of 1919 (six times the pre-war price) sugar actually reached 20% of our imports. A whole year's supply for Europe in 1700 lasts us about four days.

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* Present population 2.9 millions.

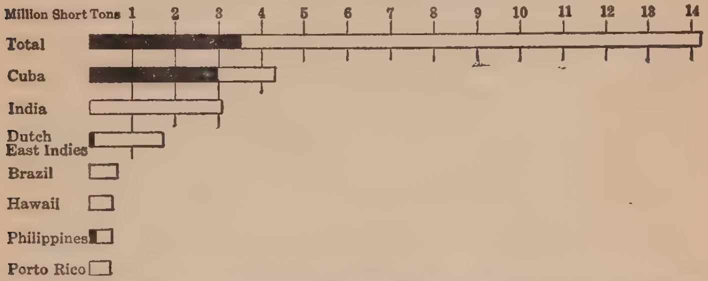

FIG. 38. Cane Sugar-producing Countries of the World, and United States Sugar Imports.
(Showing the total output of each country, average annual, 1919/21; and the portion imported by the United States, in black.)

In spite of the great increase in the world's consumption of sugar, particularly in the United States, which is naturally her best customer, Cuba's increase in production before 1900 was slow and irregular. The average annual yield for the decade beginning with 1890 was 533,000 tons — only fifty per cent over that for the decade forty years previous, 1850/59. Since American intervention, production has increased two and a half times, comparing the average for 1900/09 with that for the succeeding decade 1910/19. The maximum output during Spanish dominion was a million tons, reached in the year 1894/95. The maximum reached since was more than four million tons in 1918/19. Cuba now supplies 60% of our requirements and 20 to 25% of the world's sugar production.*

* This includes both cane and beet sugar, but omits Russia's production, for which no figures exist.

It might be supposed, perhaps, that Cuba's expansion had been hindered during the last century by competition of beet sugar. About the beginning of the century, during the Napoleonic wars between England and France, commercial blockades cut off imports of sugar into European countries from their tropical colonies. The discovery by de Serres in the 16th century and Marggraf in 1747, that beet root contains sugar, began to receive serious attention. The ultimate result has been the development of the beet sugar industry of the temperate zone, an intensive agriculture particularly suited to densely populated regions, as contrasted with the cane sugar industry of the tropics, extensive in character and worked until recently by slave labor.

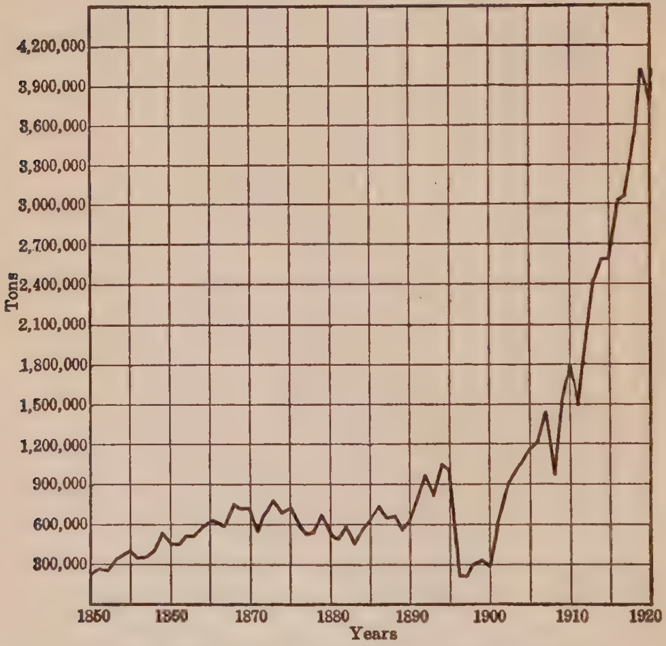

FIG. 39. Cuba's Sugar Production, 1850 to 1921.

What with the aid given to the beet sugar industry by bounties and import tariffs, and the abolition of slavery resulting in the wholesale desertion of the cane fields by negro laborers, as in Brazil, the cane sugar industry was so far curtailed as to represent at one time (1900) only a third of the world's total production. The beet sugar industry, moreover, has had the further advantage of yielding certain valuable by-products. The tops and leaves from a three-acre field of beets in Germany is worth more than the farm value in the United States of an acre of wheat. The pulp of the beets, after the sugar has been extracted, is also good cattle feed, itself worth almost as much acre for acre as wheat on the American farm. The tops and pulp together are worth more per acre than the average American hay crop.

For Cuba, however, the competition of beet sugar during the 19th century could not have been a factor preventing extension of her industry, nor could the subsequent removal of the bounties in Europe, in accordance with the Brussels agreement in 1901/2, have stimulated her production. The United States, her principal market, was importing little beet sugar, and producing next to none before 1900, and we were not one of the signatories to the Brussels agreement. On the contrary, it has been *since* 1900 that beet sugar production in the United States (and hence, competition with Cuba's cane sugar) has reached appreciable proportions. In 1900 our output amounted to only 81,000 tons, or 3.66% of our total consumption; by 1910 it had reached 512,000 tons and 14% of our consumption; and in 1916 touched 874,000 tons or 22% of our consumption. Cuba's slow development occurred when beet sugar competition was slight; her great expansion has come in the face of growing competition of beet sugar.

The reciprocity agreement between the United States and Cuba benefited the Cuban producer to a certain extent by the 20% reduction of our tariff on her sugar. Without financial security, however, it is very doubtful whether she could have made anything like the progress that she has actually achieved. American capital would have been reluctant to run the risk of loss through revolution, and Cuban enterprise, unaided, was unequal to the task.

Capitalistic Methods in Sugar Growing, Harvesting, and Milling

Before 1900 Cuban methods of cultivating sugar cane and extracting sugar were crude and primitive. It has been the extensive investment of American capital that has brought about the introduction of scientific and large-scale procedure. The sugar cane is a gigantic perennial grass, springing from the ground in a clump and growing to the height of eight to twenty-four feet; with blades or leaves two inches wide and three to five feet long, starting from sheaths around the joints or nodes in the stalk; and topped when in flower by a plume or tassel two to four feet long. It may be reproduced (*a*) from the seed; (*b*) by planting pieces of stalk, the shoots and roots sprouting from the nodes like those from the eyes of a potato; or (*c*) by allowing fresh stalks or "ratoons" to grow year after year from the roots or stubble of the harvested cane, like grass after the lawn has been mowed. Little cane is propagated from the seed, and probably 90% of the Cuban cane crop is from the "ratoons." Too long continued cropping from the original plant root, however, results in poorer and poorer yields, so that, although there is a great saving in labor, a point is reached where it pays to plant new fields. In some countries it is possible to crop continuously for fifty or sixty years, but in Cuba the custom is to crop for ten years only (in Hawaii, for only two or three).

In the first planting, the original method was merely to make a slanting hole in the soil with a heavy pole, drop in the seed or piece of stalk, and leave it to germinate or die.

Sugar cane flourishes best, however, in well-aërated soil, with plenty of moisture (at least 60 inches rainfall), and plenty of sunshine. Best results, therefore, have been obtained by thorough plowing. In Hawaii, where methods of sugar cultivation are in advance of other countries and mark the highest attainment, powerful steam plows are used which thrust down twenty-four inches into the soil. The canes are planted in furrows and supplied with water from transverse irrigation ditches.

Much attention and experiment have been devoted to the question of fertilizers. Under primitive culture, the soil is allowed to become exhausted of its nitrogen content, potash and phosphoric acid. To replace them, fertilizers should be used. It has been found that stock raising or dairy farming, with the supply of barnyard manure, is an advantageous adjunct to the sugar plantation.

Harvesting sugar cane has so far defied most attempts at improvement. The sugar is a component of cane juice found chiefly in the stalk. While the plant is growing, the glucose or invert sugar in the cane juice is gradually changed by action of the sun's rays into sucrose or pure sugar. The highest sugar content, and consequently the best moment for cutting, is reached after the leaves are faded. The practice is still followed in Cuba, however, of harvesting twelve months after sprouting, whether ripe or not. The stalk, which externally resembles bamboo about an inch to two and a half thick, is not hollow but solid, with a tough rind and fibrous strands running through softer sugar-containing tissue. No practicable machine has yet been devised that can replace the original method of cutting cane by hand. The cutter, armed with a long, heavy knife, cuts the stalk close to the ground, "tops" it (severs off the top, to be used for further planting), and chops the remainder into convenient lengths for loading and transporting to the mill. Loaders follow the cutters and pile the stalks into bundles of 75 to 100 pounds, to be carried on the shoulder twenty-five paces or so to the conveyance, ox-cart, railway car, or flume.

Since the entry of American capital, most of the innumerable small plantations have gradually been absorbed into large estates owned by the sugar "centrals." The land is now rented to the "colonos," or turned over for them to cultivate on payment of 4 or 5% of the weight of their cane in sugar. By this arrangement, the house is given free and some land for a garden. Tools and materials, etc., are supplied by the central, but debited to the account of the colono.* The advantage of large capital is felt with either method, for the central always holds the work of the colonos subject to inspection. When harvest time arrives, the small independent farmers (ingenios) have only their slow-moving ox-carts for hauling their cane. The great central uses temporary railways, or if there is plenty of water available and a suitable slope, flumes, or perhaps both in conjunction.

The greatest advantage of large capital, however, comes in the mill. The task of extracting the juice from the cane, although the sugar cane is 88% juice and only 12% fiber, is by no means as simple as one might expect. The primitive sugar mill used to consist of a couple of rollers with a lever attached, which was revolved by man power or by animals. The cane was fed between the rollers and the juice expressed, like water in wet clothes passed through a wringer. It was then boiled in open pans to evaporate the surplus water and crystallized into "grains" by abruptly lowering the temperature.

The modern sugar mill is a great factory, equipped with engines, boilers, furnaces, etc., etc. A mechanical unloader transfers the canes from the car or cart to a conveyor that carries them to the crusher. This consists of two large rolls studded with great interlocking corrugated teeth. In this machine the cane is broken into short pieces and closely matted together. Some of the juice is squeezed out and carried off to the tanks. The cane mat next passes to the mills proper, nine to eighteen rolls in sets of three (one above and two below), measuring about three feet in diameter and six and a half feet long, and forced together by hydraulic rams under pressure of 400 to 600 tons. By the time the cane has passed through the last set of rollers, most of the juice is out, at least 98%. The dry fibrous part that remains is shot down to the furnaces for use as fuel to run the engines — supplying nearly all the fuel required. The ashes are returned to the fields as fertilizer.

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* This arrangement bears a striking resemblance to that between the patrão and seringueiro in the Amazon rubber regions.

The juice has to be purified by straining and chemical processes to remove dirt, gum, wax, albumen, and salts. In settling tanks the insolubles either settle or float, thus allowing the pure juice to be drawn off. Instead of evaporating the water in open pans, special vacuum cells are used in order to avoid the danger of burning the sugar, which is likely to occur at a temperature very little above the boiling point of water (212° F.). The economy of fuel is also appreciable. In the first cell, the juice has to be heated to boiling point for a short time — not long enough to injure the sugar. The vapor or steam from the boiling juice is conducted in pipes from this cell to a second, and the juice that has not vaporized also flows into cell #2, covering the steam pipes. In this cell there is a partial vacuum, so that the heat from the vapor in the pipes is sufficient to keep the juice still boiling, though the temperature here is only 203° F. The vapor from #2 is piped into cell #3, at a still higher vacuum, where it serves to keep boiling the unevaporated juice brought from #2. The process is continued in a fourth cell, where the vacuum is 26 inches and the boiling point only 150°. The juice that is taken from this cell is now only 35% water and 65% solid instead of 85% water as when it started; only a quarter of the heat is used that would be required for evaporating in a single receptacle; and the sugar content, subjected to a temperature of 212° for only a very short time, has escaped unscorched. The final step of the process consists of crystallizing the sugar in the sirup to yield raw sugar, 96% pure, and molasses.

Modern capitalistic methods of sugar production could scarcely recognize the procedure and equipment of a quarter of a century ago, methods still remaining in use where revolution and turmoil are rife. Nor has the end been reached. The native planter, to be sure, still clings if he can to his single-handled wooden plow shod with a strip of iron. Further mechanical improvements are sought, especially to save the hand labor of cutting and loading. The discovery of a process for extracting sugar from the cane by shredding the stalk instead of crushing it, so that the fiber cells are not broken down, may rescue the fiber (bagasse), now used as fuel, for the manufacture of high-grade paper worth more than the sugar itself. There is the possibility of utilizing alcohol made from refuse molasses of the sugar mill for motor fuel in place of gasoline to drive tractors, etc. Although the best cane lands have already been taken up, there is room for further increase of sugar acreage in less accessible regions by building and extending railways.

Other Resources

Such, then, have been the advantages Cuba has reaped, during even so short a period as twenty years of peace, political stability, and financial security. We have been dwelling chiefly upon her sugar production, for this today overshadows all else — 75 to 90% of her exports — but her resources are by no means confined to sugar. Her tobacco is world famous. The finest grades are grown in Pinar del Rio, west of Consolacion del Sur near the western end of the island. Cocoa and coffee are also grown, especially in the Province of Oriente. At one time her coffee output reached 23 million pounds, but unfortunately the industry was later taxed out of existence. Cattle are raised, vegetables, and fruits, bananas, pineapples, grapefruit, oranges, various fibers. In the future we may look for an increase in diversity of agriculture.

There is plenty of room to expand along these several lines hitherto neglected for sugar, for only 10 to 15% of the cultivable area of Cuba has been taken over for sugar (2.2 million acres). Three fifths of Cuba's total area consists of gently sloping plains. About 25% is mountainous. The remainder, swampy lands and fens, can be reclaimed for cultivation when occasion demands.

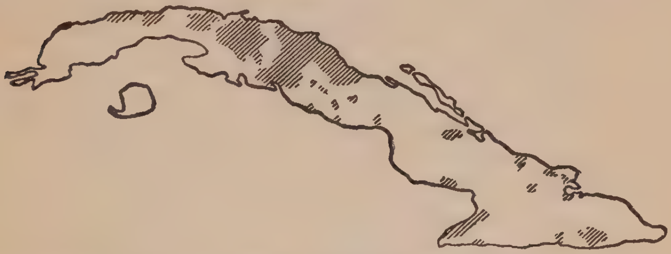

Fig. 40. Sugar-growing Regions of Cuba.
(Adapted from map in H. C. Geerligs' "World's Cane Sugar Industry".)

In regard to mineral resources, on the other hand, Cuba is generally deficient, with the exception of iron. Her iron reserves are among the largest in the world, estimated at 2 to 3 billion tons. Hitherto, this resource also has been neglected. The maximum output was about 1.6 million tons in 1913, taken mostly from fields on the south coast, which are very limited in extent (5 to 8 million tons). In 1921 our imports of ore from Cuba had declined to 123,000 tons. But the great ore fields are on the northern coast, the so-called brown ores, near Moa and Mayari in Oriente and Cubitas in Camagüey.

These ores also contain a percentage of nickel (0.75 to 0.80%). Experiments have been conducted to recover this nickel, and, from the laboratory tests and calculations, the process is believed commercially practicable. About 70% of the nickel can be removed, 50% alumina, and 60% manganese.

Cuba as a Market for American Manufactures

The reflection of Cuba's prosperity is evident in the enormous increase in her purchasing power afforded by her exports. The gain to us has been the development of one of our best markets for manufactures. Her railway extension, especially for the sugar plantations, has necessitated the purchase of rails, rolling stock, etc.; improvement of port and harbor facilities has opened a market for cement and building materials; her sugar mills are equipped with machinery manufactured in the United States. Sanitation, water supply, and sewage have received much attention in Cuba since 1900. In 1898, R. T. Hill wrote, "Northern races cannot be established there, except at the sacrifice of many lives. People from our southern coastal states, who have already attained a certain immunity from tropical diseases, might be able to endure permanent residence in Cuba, but the Northern man will find continuous residence upon the island impossible without physical degeneration and risk of annihilation." The death rate at that time according to Hill was 32 to 67 per thousand. In 1907, W. W. Ewing writes, "Today Havana is one of the healthiest cities in the world," and A. H. Verrill gives the death rate as 12 per thousand. Cities of approximately the same size in New York State have a death rate of 13.4. Other cities of Cuba are following the example of Havana, improving their water supply and sewerage disposal, and there will continue to be a steady market for piping, pumps, etc. Extensive road building is in progress according to plans of the Bureau of

Highways, and Cuba is an excellent market for our automobiles and trucks.

With regard to consumers' goods, the Spaniard's natural inclination toward extravagance creates a lively demand for articles of clothing, etc. The upper-class Cuban wishes his clothes to be stylish, tasteful, and of good quality. He buys his shoes for appearance rather than wear. After three months he throws them away and buys a new pair — he would never think of having the old pair resoled. Cobblers are non-existent, would starve for lack of work. Seventy per cent of the population is white, and since the promotion of education based upon the American system, the percentage of illiteracy has been greatly reduced. A considerable middle class is developing that will afford an increasing market for medium-grade articles.

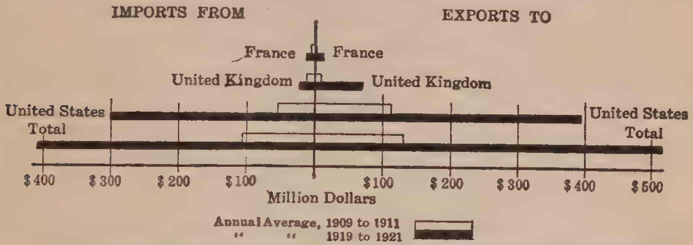

FIG. 41. Foreign Trade of Cuba, Annual Average, 1909/11 and 1919/21. (Showing imports and exports, and major countries.)

That the United States will continue to benefit most from Cuba's expansion is certain. Havana is nearer to New York in point of time than are many parts of the United States. It is less than a hundred miles from Key West, Florida, and car ferry service, daily except Sundays, tying up with the Florida East Coast Railway, facilitates expeditious and safe handling of freight without transshipment. Heavy machinery loaded on cars at the factory in the United States can be unloaded at destination in Cuba. Seventeen different steamship lines serve commerce between the two countries, and of course numerous "tramp" ships. The port of Havana, deep, capacious, and well protected, is one of the best in the West Indies in location; in facilities it is unsurpassed. It handled in 1920 no less than 8.5 million tons of shipping, carrying goods worth $408 million. These figures may be compared with the shipping of our customs districts for the same year:

CUSTOMS DISTRICT	TONNAGE ENTERED AND CLEARED	COMMERCE
Massachusetts . . .	4.8 million tons	$586 million
Philadelphia	5.4 million tons	724 million
Maryland	5.0 million tons	451 million

About the only caution one must bear in mind with regard to Cuban trade today is that she is still a one-product country. Her prosperity depends upon her sugar. Although her cane crops are singularly free from diseases, in dry years mice sometimes do them great damage. Also destructive hurricanes occasionally sweep over and beat down the cane or even uproot it. At these times business is at a standstill. Credit must be very elastic to tide over until the return of prosperity. Similar crises may be brought on by conditions in the consuming market. Although sugar is a staple and the demand constant, we have only recently experienced how overspeculation resulted in a collapse that wrecked the sugar market. Cubans were unable to obtain payment for their sugar, their general purchases ceased, drafts for merchandise already shipped were dishonored and the goods allowed to spoil on the docks. No American exporter who was caught in the crash will soon forget his experience!

But after all, these are only temporary inconveniences. To a great extent they can be met by exercise of foresight. Meanwhile, the fact remains unchallenged that Cuba's political stability has brought her prosperity and wealth, and has meant for us a valuable source of sugar supply, a necessary commodity, and a rich market for our manufactures.

SANTO DOMINGO AND HAITI

Comparisons

In contrast with Cuba stands its neighbor. The island of Haiti, second largest of the West Indies, is about two thirds the size of Cuba. The island is divided into the Republic of Haiti, occupying the western third of the island, 11,000 square miles with a population of 1.63 millions, and the Dominican Republic or Santo Domingo, the eastern portion, 19,000 square miles, and a population of 900,000.

Haiti is known as the "black republic" from the fact that it is governed by and consists entirely of negroes of African descent (90% of the population is pure black). It may be characterized by general filth and squalor, ignorance, and barbaric practices and rites — possibly cannibalism — a swarming, disease-ridden population. Black it may be, but republic it is not. Since the beginning of the nineteenth century, when Haiti's half million slaves, abused, oppressed, tortured, rose up and destroyed their 30,000 luxurious French masters, the government has been a tyranny masquerading under a republican constitution. The mass of the people may be peace loving, as is usual with their race, but their history has been nothing but a story of anarchy, crime, and destruction. Upon one occasion eight "presidents" held office in a single year. Only one president has had the distinction of living out his four-year term, retiring and dying a natural death in his own country. Females outnumber males three to one: the men are killed off by internecine struggles.

In comparison with Haiti, the Dominican Republic seems to shine. Like Haiti, to be sure, Santo Domingo is torn by civil strife. The young man "takes down his gun to enter politics." Her history has been a merry whirl from Spanish to Haitian rule, then to independence with civil strife, and back again. But the Dominicans are more progressive and of broader vision than the Haitians. There is a considerable percentage of whites (Spanish) and at least 50% of the people have traces of white blood. Only 25% are pure negro. Instead of being hostile to whites, white immigrants are especially desired and foreign enterprise eagerly attracted. While the Dominican himself has no interest in industry, and while investment and thrift have been checked by the fighting, foreign property is always scrupulously respected. The peons in Santo Domingo are poverty stricken, but there is no real suffering, and there is no such unrestrained breeding of population as goes on in Haiti. With almost double Haiti's area, Santo Domingo has about half the number of inhabitants; her density of population, three quarters that of Cuba.

The trade of both Haiti and Santo Domingo reflects the pitiable state of their internal affairs. Together, their per capita trade amounts to about a seventh that of Cuba. Even in 1900 it was less than a quarter, showing that even Spanish misrule in Cuba has been better than "independence."

American Intervention

By 1904, political conditions in Santo Domingo had plunged the country into such a morass of indebtedness that European creditors decided it was time to force a payment of their claims. Repeated efforts through diplomatic channels had been unsuccessful, so that the only road left open was seizure and control of the customs — the chief source of revenue of the state. French and Italian vessels were reported already on their way. In his desperate dilemma, President Morales appealed to the United States. Here was obviously a case of the extension of European control in the Americas, a thing contrary to our national policy as laid down in the Monroe Doctrine. Nevertheless, Congress refused to ratify the treaty proposed to relieve the situation, and President Roosevelt was obliged to resort to a purely executive measure, according to which the United States did not formally intervene, but Americans were to collect the customs in Santo Domingo under protection of United States warships. Thus, in fact, the United States became a receiver for the bankrupt Dominican Republic, preserving the policy of the Monroe Doctrine — contrary to our own public wish, be it noted, and earnestly requested by the administration of Santo Domingo.

Our presence, however, failed to counteract entirely the deep-rooted elements of anarchy. Assassinations and revolutions continued, and the terms of the agreements made in 1904 and 1907 were not fulfilled. The United States again lent its good offices to restore order in 1914. But international complications were still brewing. Another civil war became imminent and French and British men-of-war lay off the capital. With the consent of President Jiminez, then in office, who did not feel competent to guide his country further, American marines were landed and the revolutionist leader, Arias, given twenty-four hours to leave the capital. To avoid further difficulties, a treaty was arranged whereby the collection of customs was continued under American auspices, an American financial adviser appointed, and a constabulary force established, officered by Americans. This treaty was declined by the Republic. Forced into a deadlock, the American government took matters into its own hands, and proceeded to occupy the Republic, November 29, 1916, and promptly took over the entire administration.

The United States protectorate of Haiti came about in much the same way. Political leaders were struggling for mastery, when Germany and France made a formal demand for control of the customs — again a situation dangerous for the independence of Haiti and unpleasant for the United States. French marines were actually landed to protect foreign interests. Eventually, however, an agreement was arranged similar to that proposed for Santo Domingo. The United States controls the customs and all expenditure of public moneys; the constabulary is commanded by American officers; revolutionary forces are disarmed; and Haiti may cede no territory to any nation except the United States. The convention is to last ten years, or if order has not then been sufficiently established, double that period.

The effect of United States intervention in Santo Domingo in 1904, even though unsuccessful on the whole, was sufficient to restore confidence in the country. The result is clearly shown in trade figures — not to the extent of Cuba's, of course, but enough to prove our point. In 1900 and until 1905, Dominican trade was hardly more than half Haiti's. By 1910, it had almost doubled, while Haiti's remained stationary. The real increase began in 1915. From this time the total value of her trade jumped 20 to 35% each year, so that in 1920, with a total five times as great as in 1910, it was more than double Haiti's figure.

Some share of this increase was due to inflated values (which operated equally for Haiti, of course). Nevertheless her sugar output increased from about 50,000 tons at the opening of the century to 90,000 tons in 1910, 180,000 tons in 1920, and to 255,000 tons in 1921! Cacao production, about 11 million pounds in 1900, trebled by 1910, and reached 52 million pounds in 1920. Tobacco, her third major export, increased tenfold in the twenty years: 3.95 million pounds in 1900, 27.5 million in 1910, and 39.4 million in 1920.

But Santo Domingo is just on the threshold of her prosperity. As we have already observed, the per capita trade of Santo Domingo is still far below that of Cuba — only $110 in 1920 to Cuba's $445. With the same density of population as Cuba and the same per capita trade, she should have five times the commerce she now has. What are the prospects of such a development, now that she has secured a stable government, at least for the time being?

Prospects of Economic Development

Although the island of Haiti was the first in America to receive a white colony (established in 1493 by Christopher Columbus at Navidad, now Petit Anse) practically 90% of the land is still virgin. The fertility of the soil in many places is unsurpassed. Where in Cuba "on *new* land it is necessary to replant cane [after cropping] for from ten to twelve years," and "on some lands, weakened by continued cropping, from four to seven cuttings of cane are followed by replanting," in Santo Domingo, "fields of sugar cane are known to have been in existence for more than thirty years on the same spot; they have neither been renewed nor fertilized in any manner, yet they are still yielding first-class cane." The first crop on virgin soil gives a return of 90 tons per acre; a good crop in Cuba averages less than 30 tons per acre, although occasionally 55 tons are obtained.

The topography of the island is more rugged than Cuba's. The story goes that a British admiral, to describe the island to King George III, crumpled a paper in his hand and, throwing it upon the table, said, "That, sire, is the island." But the mountain slopes and the valleys are very rich and productive. The Statesman's Yearbook gives the area of cultivable land of Santo Domingo as 15,500 square miles, or 80% of her total area. The total cultivable area of Cuba is only about double this, and her entire sugar production is taken from about 3500 square miles. "Taken as a whole," the United States Committee of Inquiry reported in 1871, "this Republic is one of the most fertile regions on the face of the earth. The evidence of men well acquainted with the other West

Indian Islands declares this to be naturally the richest of them all."

The plain lying along the northern part of the island, named by Columbus and still called the Vega Real or "Royal Meadow," is deep, rich, inexhaustible loam deposited there through countless ages. It is well watered and well drained, receiving numberless streams from the mountains and sloping gently from an altitude of 722 feet down to the sea. Although only 800 square miles in area, it is doubtless the region that will see the greatest agricultural development in the near future. Readily accessible to the Vega Real is one of the finest natural harbors in the world, best by far in the West Indies. This is Samaná Bay.* It is thirty-five miles long, ten to fifteen wide. There are two channels, one suitable for large vessels, about 2000 yards wide and 50 to 140 feet deep; the other, narrow and shallow. The remainder of the harbor mouth is protected by shoals and keys or islets.

To the south of the coastal range are other plains. The Seibo plain at the southeastern end is about 3500 square miles in area. It is covered with forests and broad savannas. In the center of the island are the Constanza and the "Central" Valleys, today almost inaccessible, but containing 2000 to 3000 square miles of rich fertile land.

In addition to her natural fertility, Santo Domingo will enjoy all the advantages of a late arrival. The latest improvements of equipment will be hers, instead of being obliged, like Cuba, to scrap the old before adopting the new. The milling of sugar, for instance, requires a tremendous amount of power throughout every step of the process. In Cuba steam and gasoline have been used. It has been proved, however, that electricity is far superior. With a rainfall averaging 120 inches per annum in the northern part, and a topography cut up by mountain ranges, Santo Domingo has innumerable streams suitable for power development. Up-to-date sugar mills can introduce their electric equipment at the start.

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* The city of Santo Domingo is situated at the mouth of the Ozana River. The "harbor" is shallow and constantly fills up with sediment. Ships have to be reached by lighter and small boats, often very dangerous in a rough sea.

With agricultural development will naturally come improvements in transportation as in Cuba. Roads today are mere trails, difficult and dangerous even in dry weather. The present length of railways in operation is about 150 miles. With access to the interior, the mineral resources will be made available. The mountains are known to contain all kinds of minerals, especially iron, copper, and gold, but practically no serious prospecting has been done. Santo Domingo holds out all the lures of possibility.

Municipal improvements will be made. The climate itself is salubrious. Only the total disregard of the rudiments of sanitation, particularly in the towns, causes a menace to health. In spite of such conditions, there is comparatively little sickness. Yellow fever is unknown. Progress is already being made under the boards of health established by law in 1912. Once proper sewage and water supply are effected, the Republic will become a winter playground for Americans who enjoy mountain scenery and wish to escape the rigors of the northern winter.

At present standards of living are low and illiteracy profound except in the upper class. The principal newspaper, a four-page sheet, has a circulation of about 10,000 copies. There is a general appreciation of the importance of education, however, and results of the extension of public instruction will soon be felt.

As for Haiti, what may we say? Like Santo Domingo, her resources, mineral and agricultural, are capable of enormous development. The forests contain great stores of hardwoods and dyewoods. But even under the tutelage of the United States, it is problematical what may be accomplished there. For the present, at any rate, the prospect cannot compare with that of Santo Domingo.

PORTO RICO

The Handicap of Faulty Development

Porto Rico is an example of a country handicapped by overdevelopment along wrong lines, and therefore unable to take full advantage of the benefits of stability and security afforded by her connection with the United States. For a whole century before our acquisition of Porto Rico, Spain had been especially interested in her prosperity and had offered liberal inducements to attract immigration. Thus in 1899, although like Cuba her population was preponderantly white (62%), she was much more densely settled: 278 persons per square mile as compared with Cuba's 35 per square mile. Today, on an area of 3435 square miles, or 8% the size of Cuba, she has a total population of 1.33 millions, little less than half that of Cuba.

Porto Rico responded almost instantly to the benefits of her connection with the United States, but after the first spurt, her rate of advance has declined. Her exports show a constant improvement — an increase of 3.4 times from 1903 to 1910, and over four times from 1910 to 1920. But part of this increase was due to inflated prices. Sugar, which represents 55 to 60% of the total value of her exports, after having increased by 300% from 1903 to 1910, was only one and a half times as much in 1920 as in 1910.

Most of her sugar land is farmed by small "colonos," owning one to ten acres (average five acres) as compared with the average holding in Cuba of sixty-seven acres. In 1900, when there was a chance that American capital might deprive the small farmers of their property, a law was passed expressly forbidding large holdings. Thus whatever improvements might be introduced in the milling of sugar, advancement in methods of agriculture has been possible only through education and propaganda, a slow and tedious process.

Although the original fertility of the soil in Porto Rico was undoubtedly as great as that of Cuba and Santo Domingo, it has become exhausted by constant cropping. The average yield of cane is about fifteen tons per acre as compared with 28 tons in Cuba; the sugar content is 1.77 tons to Cuba's 2.46 tons. The farmers still persist in not plowing deep enough and in planting in holes — wasteful and uneconomic. And finally, Porto Rico, owing to her long-continued carelessness, has the misfortune of suffering from well-nigh every kind of sugar cane disease and pest known.

Thus although the climate is favorable and labor, of course, is cheap and abundant, it would seem probable that the next few decades will see a heavy migration of labor to the better favored regions of Cuba and Santo Domingo rather than any marked increase in her own production — commensurate, at least, with the impulse of the first decade of her connection with the United States.

CHAPTER IX

CENTRAL AMERICA

Central America has the same potential wealth of resource as the West Indies. Coffee is the major export, but the Banana industry is our chief interest — as an example of methods of successful enterprise in the tropics, and possibly a means toward stability. But to duplicate this achievement might arouse conflicts of interest, to be controlled in the first place only by a strong government; and Central America's political instability is inherent in the character of the people. There is no hope for permanent improvement, except by external intervention, a question involving the Monroe Doctrine and responsibilities of the United States.

Resources

Having before us such instances of countries of the Caribbean region that have obtained some assurance of stability of government and security of property, we may now turn our attention to the less fortunate countries that are still in the throes of political turmoil. Our interest is to ascertain whether there is any solution to their difficulties, and what possibilities exist for improvement in the near future.

Much of the area of Central America is occupied by mountains, but we find the same wealth of resources, the same wonderful fertility of soil that we observed in Cuba and the island of Haiti. The loam of decayed vegetable matter, the potash and other derivatives of volcanic ash, so valuable as fertilizer, make possible continuous cropping with little diminution in yield for thirty, fifty, more than a hundred years — and that with the soil stirred to a depth of hardly more than three inches. In Guatemala, where cattle raising is still on the range system, it is said that one acre is amply sufficient to fatten a steer. This is even better than in Argentina, where in rich sections twenty years ago, under the ranch system and by planting alfalfa, you might "raise

3000 head on 6700 acres." In the last ranging regions left in the United States, in New Mexico, it takes sixty acres to support one steer. Mineral resources are still practically unexplored, but there are known to be rich deposits of copper, iron, the precious metals, etc., throughout the entire length of the mountains.

Although practically every crop known to the temperate and subtropical zones can be raised, and everything flourishes in tropical abundance, little is grown for export by the native Central Americans except coffee. It represents 50 to 60% of the total value of the exports. The high lands along the Pacific side of the mountains, where the aboriginal Indians made their homes and where the present population is concentrated, are also most suitable for coffee culture.

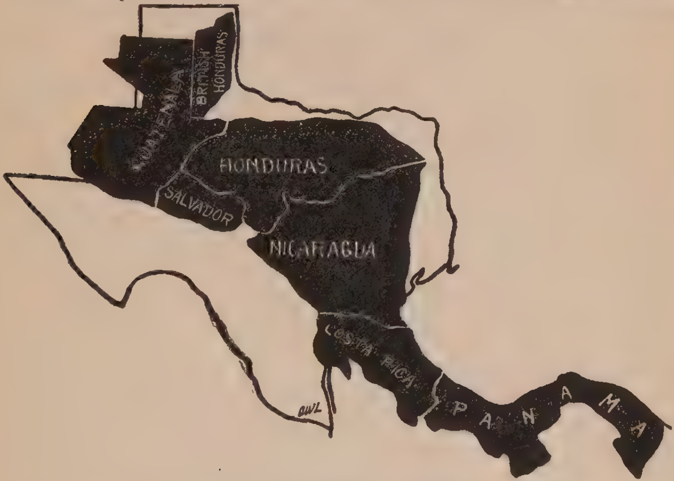

Fig. 42. The Central American States.
(Superimposed upon Texas to show comparative area.)

The Banana Industry

Central America is popularly identified (aside from revolution, anarchy, and assassination) with the banana. This is partly because our coffee imports from here amount to only about 10% of our total imports of coffee, and are lost beside those from Brazil. Moreover, to judge from statistics of world trade in bananas, one would be led to believe that the Caribbean region is the only place in the world where they are grown. Ninety-five per cent of the world's banana exports come from there, small and irregular amounts being exported from the Canary Islands, Hawaii, and perhaps Brazil. As a matter of fact, the banana grows much more extensively in the eastern than in the western hemisphere. It is said to have originated in the East Indies. Because of its perishability, however, it is rarely exported. Only recently, since improved steamship and railway transportation has effectively reduced time and distance, and since the growth of a large consuming market so near a banana region as the United States to Central America and the West Indies, has the banana entered into commerce. The United States still takes 80 to 90% of all the bananas exported.

Not only are the banana exports actually secondary in Central America — about 10 to 20% of the total exports — but the industry is purely exotic, supported by foreign capital, managed by foreign enterprise, and the employees themselves imported from the West Indies. Nevertheless, the banana industry must remain the focus of our interest. Its real importance is not a matter of figures and percentages. It is significant as showing what can be done in the conquest of the tropics and in spite of the political turmoil that characterizes the whole region — and how it has been accomplished. It is considered by some writers important also as indicating the possible road to a solution of the Caribbean problem and perhaps thereby a solution of all our Latin-American complications arising under the Monroe Doctrine.

Contrary to popular opinion, the banana "tree" is not a wild jungle plant whose fruit simply has to be picked off the branches. The banana with which we are acquainted is little grown by natives, for it has to be carefully planted, weeded, drained, irrigated, and even watered during droughts — labor that is entirely repugnant to the tropical dweller. There is a species of wild banana in Central American jungles, but it has no pulpy fruit fit to eat. Several kinds simply have seeds contained in a pod, like peas, and fail to respond to cultivation. The plantain, which grows wild and is the mainstay of existence of the natives in the tropics, is similar to the banana and often confused with it, but is used as a vegetable rather than a fruit.

Our banana is one of only four edible varieties out of some sixty species of "Musæ." It is a plant that has no seed but is propagated from an underground tuberous "bulb," part of the parent plant. When the young shoot, which has sprung from the parent bulb, is six or eight months old, nine or ten feet high, with its own bulb eight inches or so across, it must be cut away from the parent to be transplanted (a month later) in a field properly prepared to receive it.

Preparation of the land consists of clearing it, if forest-covered, plowing nine inches deep and cross-harrowing, repeating the plowing, and cross-plowing and harrowing again after having left it to lie fallow two months or more. Finally, holes must be dug at distances of fifteen feet to receive the young plants. Planting too closely causes too much shade, weak stems, and irregular bunches of fruit; planting too far apart allows the sun to burn the soil and roots. Irrigation channels must be dug near the young bulbs, not only to supply water regularly (every five or six days), but to afford proper drainage; for while too little water delays growth, too much causes decay and prevents air from penetrating to the roots. A loose mulch or surface soil should be spread to prevent too rapid evaporation of moisture from the sub-soil.

When the sucker has been cut away from the parent bulb, it is itself pruned to within six inches of its bulb and the roots are trimmed off. The new shoots that spring from the young bulb are also kept pruned for three months after planting. Then one shoot is allowed to grow and the rest are pruned for three months, when a second is left, and four months later a third. The true stem of the plant is the bulb, which is a storehouse of food. What appears to be the trunk of a tree is simply a cylinder of concentric layers of leaves, the outermost being the oldest leaf, protecting the long flower stem in the center. When the flower stem reaches the air, the last leaf hangs over to protect the flowers from the direct sun.

In harvesting, a "cutter" chops the trunk five or six feet from the ground so that the top, with the fruit, falls within reach of the helper. This man cuts the bunch and gives it to a woman to carry to the bookkeeper to be inspected and recorded, and to be loaded on the wagon or car. The leaves of the mutilated "tree" are stripped off and chopped up to be spread for fertilizer. The stump is left to wither, while new ratoons spring from the bulb. It is customary to replant after intervals of three to six years — a portion of the field annually. Before replanting, it is sometimes advisable to restore humus and manure by sowing leguminous crops, such as beans, and turning in cattle to graze down the dense vegetation.

The yield from one acre amounts to 330 bunches of bananas per annum. In food value the banana is recognized as a "perfect food." It contains in ample proportions nutritive constituents easily digested and is free from irritants. In composition, it compares with the potato, though higher in fat and carbohydrate (460 calories per pound as compared with 385 calories for potatoes). Thus, per acre of land, it yields no less than 242,000 pounds of food value as compared with 4000 pounds for potatoes and 2000 pounds for wheat. Dried banana flour compares pound for pound with wheat flour. It is only a question of time when bakers will be using it for our bread — and incidentally effecting a tremendous economy by turning to use thousands of bunches of bananas now rejected at the docks and on the plantations as unfit for shipment. Already the banana is almost a staple article, and we consume per capita, every man, woman, and child, some five dozen bananas per annum.

A German clerk, C. B. Franc, living near Colon (Panama) was the first to conceive the idea of sending bananas to New York and Philadelphia (1866). In 1870 a ship captain, L. D. Baker, looking about for a return cargo to Boston from Jamaica, took a long chance, finding nothing better, and shipped some bunches of bananas. By good luck he made a quick voyage and got his fruit on the market before they had spoiled. His venture was so successful that he struck up quite a trade. Still the fruit was such a curiosity that some dealers used to wrap each banana in tinfoil! It was not until 1884 that A. W. Preston, a Boston fruit merchant, saw the opportunity to develop a great industry and make the banana a staple commodity. He succeeded in organizing the Boston Fruit Company, which later (1899) consolidated with twenty-one other companies to form the United Fruit Company.

Among the innumerable difficulties met with in the course of the development of the company, there were four or five which, while pertaining to the banana industry, are also important for any enterprise in this region. Destruction of crops by tropical hurricanes, floods, and droughts is a constant menace. The small planter or trader, who must stake his all upon the fortunes of a single district, has at best a pure gamble. The large concern can reduce the risk by spreading production over a number of districts sufficiently remote from each other to avoid identical weather conditions. Risks may also be reduced still further by diversification of production. In both these respects, the United Fruit Company has taken the necessary precautions. It has properties scattered throughout the entire Caribbean region, and it is concerned, not only in the growing of bananas, but also of oranges, pineapples, sugar cane, coconuts, cacao, and rubber, and in raising cattle. If one region is devastated or one crop ruined, the company is not thereby thrown into bankruptcy, but may be able to offset its losses by bountiful harvests in other regions or of other crops.

A more serious problem to be solved was that of living conditions in the disease-stricken tropical wilderness. Even the natives refused to live in the coastal districts.* "The tropics" was synonymous with dreadful pestilence and lingering death. The United Fruit Company anticipated Col. W. C. Gorgas and his staff at Panama in proving that this deadly country can be transformed by proper sanitation into a habitable region. At the time the United States government began to work on the Canal (1904), the United Fruit Company had five hundred square miles, an area greater than that of the Canal Zone, under careful sanitary supervision. Houses were screened with copper netting (necessary where rust destroys so quickly), pools were drained and sluggish streams and lakes covered with petroleum to prevent the growth of the mosquito nymph; hospitals were built, thoroughly equipped, and manned with complete staffs of nurses and doctors.

The banana industry had its birth in Jamaica (which is still responsible for a third of the world's exports). When expansion to the mainland was attempted, it was found that the natives, although practically immune from diseases fatal to foreigners, have an unconquerable aversion to physical toil. As this is said to be due to the ravages of the hookworm and other parasites, it is not impossible that a generation or two of observance of the rules of sanitation might correct the difficulty. Hitherto, however, it has been necessary to import the more virile negro labor from Jamaica. Only in Colombia do the natives show sufficient energy and initiative to enter the industry, either independently or as employees of the company.

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* Remarkable ruins of a prehistoric civilization, temples and a city, Quirigua, have recently been uncovered in the depths of the Guatemala jungle near the Monagua River. (See the *National Geographic Magazine*, March 1913, for account and pictures.)

The transportation problem is, of course, more vital for fruit than for most commodities, but it must be dealt with as a factor in any enterprise. The penalty for including a slightly bruised or overripe banana is contagion to hundreds of other bunches in the same shipment, just as one rotting apple will spoil the whole barrel. It is not sufficient that the utmost skill should be used by the men who direct the cutting of the bananas to select bunches that are at precisely the right stage of development, not too ripe or too unripe, to reach the particular market for which they are destined — Boston, Philadelphia, New Orleans, or interior points, as the case may be. A transportation system operating throughout with the nicety of clockwork is essential. In Central America railroads are short, wagon roads are few, even mule trails are poor. The United Fruit Company has constructed for its own use railways and proper dock facilities, and has equipped itself with a fleet of fast steamboats.

For most enterprises the building of railways would entail a risk of destruction through revolutionary activities too great to warrant the expenditure. In any military action, the first step is to destroy the means of communication and supply of the enemy. Fortunately for the United Fruit Company, its operations in Central America have been confined to regions sparsely populated and little visited by the natives. Nevertheless, the Company has not been able to avoid political complications, it is charged, in order to influence the politics of the several countries in its own interests. Whatever truth or falsehood there may be in the accusation, or however damning it may be if true, it is certain that hitherto, at least, no enterprise could become established in these countries unless it were of sufficient size and strength to command the respect of whatever political party might be in power.

The foregoing recital of the obstacles met and overcome by the United Fruit Company is an indication of the requisites of any enterprise that wishes to exploit the rich resources of Central America. The resources will lie dormant, a virgin field, until enterprise can build railways, introduce equipment, improve living conditions, perhaps even import suitable labor, and maintain law and order for itself. This much has been achieved by the United Fruit Company with certain benefit to the seething republics. It has been thought that other such companies working in the states of Central America might prove a powerful factor in introducing political stability and bringing about the economic development of the region in spite of its political instability and other disadvantages. It is possible, indeed, that other companies might find it easier to follow the lead of the United Fruit Company, but a serious question would arise. The banana industry, a purely exotic enterprise, as we have said, has established practically a state within a state. Would it be possible for two companies of such size and power, and very likely with conflicting interests, to exist side by side in a country with a weak chaotic government? Law and order should start from the top, not in strong, independent, privately owned and directed industrial companies. To achieve such real and permanent reform as to make the country safe for other enterprise, it will be necessary first to remove entirely the fundamental causes of political disturbance.

Causes of Political Instability

But the root causes for the plight of these countries are deepseated indeed. Spanish intolerance, exemplified in the horrors of the Inquisition (1481), is found in these countries, refined by a process of selection and strengthened by generations of practice. The old "conquistadores" who sought their fortunes in the search for El Dorado were the most indomitable, intrepid, and audacious of men, but also cruel, lawless, and turbulent. Arriving in new lands, they proceeded to plunder and enslave. Small wonder that their descendants, bred to sights of cruelty and revenge generation after generation, have retained many of their characteristics. The ruling families, with their inherited distaste for labor, have little with which to occupy themselves or to satisfy their ambitions except the pursuit of office and power. Even property holders, whose interest should lie with law and order and good government, take the lead in civil strife to aggrandize themselves by spoils of the defeated party. Their constant feuds are perpetuated by persecution, confiscation of property, exile, and murder. Although each state has a republican constitution, actual operation of the government along democratic lines is impossible. The white upper classes are absorbed in their feuds and intrigues, and the peons, virtually slaves, are too debased and ignorant to vote intelligently, even if they were allowed the chance.

Note

Warfare is not confined to domestic dissension. The absence of natural topographic boundaries — political boundary lines were drawn with little regard to economic spheres of interest or to natural defenses — offers a constant temptation to ambitious statesmen to extend the area of their country. Efforts have been made from time to time to unite all the states into a single federation, but such agreements can endure only while the autocratic rulers who made them remain in power. The successor in office on either side is likely to repudiate the entire agreement. Thus stability of their international relations must wait upon internal stability of the constituent members.

Not all of the states are equally hopeless. Costa Rica boasts a period of forty or fifty years without a single revolution. Her government is respected and obeyed. Her educational system is superior to any between the United States and Chile. If it were not for her continued defaulting on her financial obligations, her international credit would be high. But Costa Rica has certain advantages which the other states have not. Her population is nearly homo-

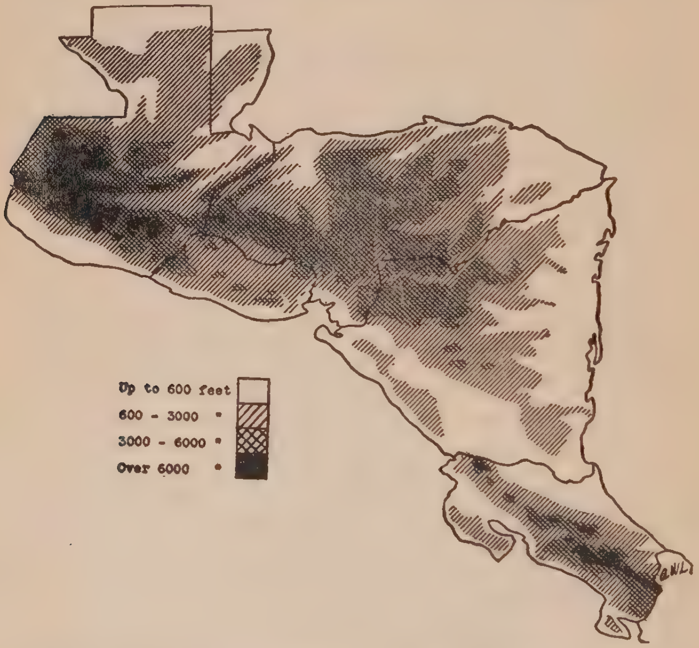

Fig. 43. Topography of Central America.
(Showing lack of conformity of political and natural boundaries.)

geneous. The original conquerors killed off the Indians, and then found themselves obliged to do their own work! Consequently they have acquired habits of industry that their apparently more prosperous neighbors have not, and labor has saved them from the idleness that conduces to political unrest. Costa Rica also has the good fortune of considerable geographic isolation. There is no temptation for her to wage aggressive warfare upon her neighbors, nor for them to attack her. As a nucleus for a federation, however, Costa Rica affords little hope. She is unwilling to assume the burden and responsibility implied by such a position.

In short, the situation in Central America briefly stated is as follows: There can be little expectation of economic development or investment of American capital and enterprise until political stability and security of property have been attained. The political condition is the result of the inherited character of the ruling class on the one hand, and the debased condition of the lower class on the other. To expect a change in the interests and ambitions of the aristocracy would be to presuppose the solution of the problem itself. While the prize for successful revolt is sufficient to stimulate ambition, revolt will continue, interrupted only when some exceptionally strong dictator can hold the reins for a longer period than his predecessors. There remains the possibility of improvement by education of the masses. But this is contrary to the immediate interests of those in power, just as emancipation conflicts with the interests of the slaveholder. Whereas slaves can be freed by a single executive edict, moreover, education requires years of patient and consistent endeavor. A solution of the problem of Central America cannot be sought from within.

The Question of Intervention

The only possibility for improvement, then, seems to be external governmental intervention. Intervention by any

European state, of course, would be intolerable to us. The great South American states, Argentina, Brazil, and Chile have sufficient concerns of their own without assuming responsibilities of other countries. Besides, they have no earthly interest in the good behavior of the Central American states. They have no trade relations and they are competitors for foreign loans and investments.

Public opinion in the United States, except on the occasion of some particularly flagrant instance of blackmail or murder of American citizens, is strongly opposed to our intervention. "Let them stew in their own juice," we say. "We have enough to attend to at home without meddling in the affairs of pepper boxes in the tropics. And as for the persons who are doing business there, why, if they want to take the risk, that is their lookout; only don't let them expect us to put our hands into the fire to pull them out." *

This attitude indicates a complete failure to grasp the real significance of the question. We may indeed adopt, or rather continue to maintain, our past policy of *laissez-faire* or non-protection toward private enterprise of our nationals in foreign countries, but we cannot dictate a like policy to other governments. To forbid them to protect their interests, as we virtually do under our interpretation of the Monroe Doctrine, is either to shift the obligation of intervention on their behalf to our own shoulders, or to place us in the odious position of *particeps criminis* in the misdeeds of our southern neighbors. We may neglect the money and lives of our own citizens, but the crux of the problem is the risk of loss to citizens of France, Germany, England, Italy.

But why not abandon the Monroe Doctrine that places us in such an odious position? It is a "red rag" to all Latin

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* The Louisville *Courier-Journal*, for example, wrote with regard to the Mexican situation, "We owe nothing to the lives and properties of the Americans who are still there. They went of their own accord. They did not go for their health, but for gain. They took the chances with their eyes open."

America. We hear on all sides, at home as well as throughout South America, that the Doctrine has outlived its purpose. When it was written (Dec. 2, 1823), the republics in South America had but recently won their freedom. They were weak and might easily become the prey of strong European countries, whose monarchs in solemn convention (1822) had agreed that "the system of representative government is equally incompatible with monarchical principles, as the maximum of the sovereignty of the people with the Divine Right," and had engaged "mutually, in the most solemn manner, to use all their efforts to put an end to the system of representative government in whatever country it may exist in Europe, and to prevent its being introduced in those countries where it is not yet known." Now some of those republics are great and powerful nations, very conscious indeed of their own importance. It is an insufferable insult for us so ostentatiously to offer, nay, thrust upon them, our generous protection from European trespass, for which they have no need. Judging us, perhaps, from their own natural tendencies toward conquest and dominion, they suspect that our vaunted "Monroe Doctrine" is simply a cloak behind which we hide sinister designs against the liberty of our weaker neighbors.

Are the South American republics yet strong enough to stand independently? Argentina, Brazil, Chile, yes; but assuredly not these little Caribbean states. On the other hand, European nations have the traditions of centuries of self-advancement. They are pressed for room. Can they be expected to deny themselves an opportunity to promote their own interests, if once they are allowed to establish themselves in new territory on this side of the ocean?

Those who advocate the abandonment of the Monroe Doctrine are mistaking a shadow for the reality. The Doctrine is nothing more than a notice of our attitude toward the extension of European political control in the Americas.

Are we today any more anxious to see such an expansion of European dominion south of us than we were a hundred years ago? Our interest is stronger than ever. The enormous investment of American capital in the Panama Canal is insignificant beside the consequence of the Canal for our trade, our maritime defense, and, resulting from these, our standing among the nations of the world. To other nations the Canal is important. To us it is vital. That our government appreciates its significance is evident from the course of its recent policy. It has established naval bases, fueling stations, and wireless plants at strategical points in the Caribbean; purchased from Denmark (1917) her barren West Indian properties, the Virgin Islands, sometimes called the "Gibraltar of the West Indies," whose chief or only asset is the fine anchorage in the harbor of St. Thomas; entered special provisions in our agreements with Cuba, Santo Domingo, and Haiti looking toward the maintenance of other stations; and even gone so far as to oppose like efforts on the part of other nations (*e.g.* Japan), and in our various treaties to forbid by express stipulation the privileges we demand for ourselves. Whatever may be said of the ethical principles involved in our diplomacy, it certainly indicates conclusively that the attitude of our State Department, whether under Republican or Democratic administration, has intensified rather than weakened since 1823. Discard the "Monroe Doctrine" if it pleases you to do so, but our *attitude* must remain the same.

Our concern in this region has increased, but not alone because of our own economic interests. Those of European nations have also increased. Their West Indian properties have hitherto been liabilities rather than assets. The trade of these islands has sought the American market rather than enriched the European owner. Yet France, Holland, and England are all diligently expending large sums to improve port facilities and to establish fueling and wireless stations, etc., even in islands as remote from the important trade routes as Curaçao or Martinique. With such indications of their feelings, it is obviously essential that we should allow no occasion to arise requiring, or even affording an excuse, for belligerent operations anywhere in this region. We must if possible anticipate and so avoid foreign complications, rather than await their arrival.

Passivity, of nation or of individual, never yet has prevented positive results. Until recently our State Department has been careful to maintain an attitude, as far as possible, of non-interference in the political turmoils of our southern neighbors. It is said that our representatives have been expressly enjoined to strictest neutrality of thought and deed. If this policy is the result of public opinion at home, the public should be enlightened, and the sooner the better: this attitude places us in the position of protecting defaulters, and it is inconsistent with our other policies and interests relating to this region.

We face a disagreeable situation, to intervene or not to intervene. If we intervene — and here lies the only hope for improvement of economic conditions in Central America — we not only assume a burden altogether distasteful and onerous, but we call down upon our heads the fear, suspicion, and hostility of all the Latin-American states from the Rio Grande to Tierra del Fuego. If we do not intervene, we tacitly encourage disorder in the Caribbean region, we open the door to serious political complications with Europe, and endanger vital national interests.

CHAPTER X

MEXICO

Mexico offers the same problem as Central America. She has enormous potential resources, agricultural and mineral, the result of her geographic position and topography, but requiring capitalistic enterprise to develop. Her petroleum is of great importance to the United States: our reserves are being depleted, while our requirements have grown imperative. Mexico is the world's chief source of silver. Her copper may be a valuable supplement to our own resources. Sisal we import in large quantity for binder twine. But Mexico's problem lies in her people: a small white aristocracy, a restless, unpractical mestizo majority, the Indian, a ready tool of the mestizo. Mexico's history has been a struggle of the mestizo to subordinate the white with the aid of the Indian. The only stable government, under Diaz, failing to raise the Indian above the influence of the mestizo, was overthrown, and the present mestizo régime is marked by characteristic anti-white sentiment, expressed as anti-capitalism and anti-foreignism. Can the mestizo correct his hereditary defects and prejudices, and establish a durable democracy?

The Resources of Mexico

MEXICO offers a problem similar to that of Central America, but vastly more imposing. In Mexico as in Central America, we find rich resources greatly needed by the civilized world, but which the Mexicans themselves have not the ability, the energy, or the capital to exploit. We find the same political turmoil, arising from the same fundamental causes whose roots reach far back into her past history, to discourage enterprise. And in the question of our relations, we are placed in the same equivocal position, harnessed to the same odious responsibilities under the Monroe Doctrine.

Mexico has been likened to a beggar sitting on a bag of gold — a cornucopia her shape, but one with the mouth rigidly up-turned: Mexico's potential resources have ever remained locked up from the world and from her own people,

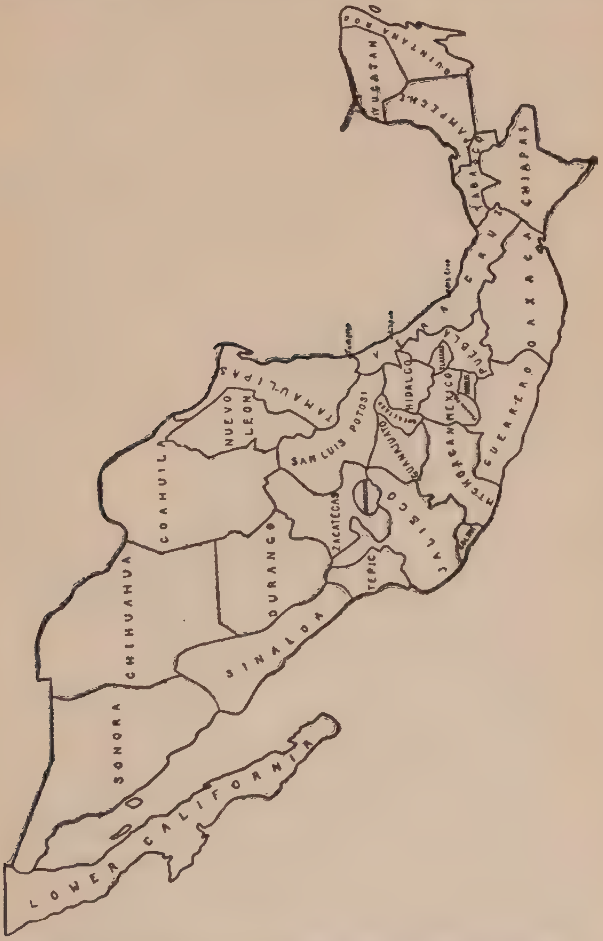

FIG. 44. Mexico.

awaiting the releasing touch of capital and enterprise. Poverty stricken, plunged in debt, a steady defaulter of her obligations for eighty out of the past hundred years, yet possibly the richest undeveloped accessible country on the earth! Ninety per cent of all the kinds of fruits in the world are grown in Mexico. Products of the tropical, subtropical, and temperate zones are at home there. Forests of pine and oak clothe the mountain sides, and tropical hardwoods grow in jungles of the lowlands. Minerals of every kind abound in the rocks.

Her wonderful variety of resource is the combined result of her geographic position and her topography. The great chain of mountains that extends along the western side of North America from Alaska to the Isthmus, spreads like a fan over practically the whole of Mexico — except for two flat strips on either coast, narrow on the west side and up to a hundred miles in width on the east. In the interior, however, between the high wall of the western Sierra Madre and the somewhat lower range of the eastern Sierra Madre, the feet of the intervening ranges are buried, thousands of feet deep, by volcanic débris and accumulated silt carried down from the mountains and deposited by the streams through countless eons. Thus, after one has ascended the mountain

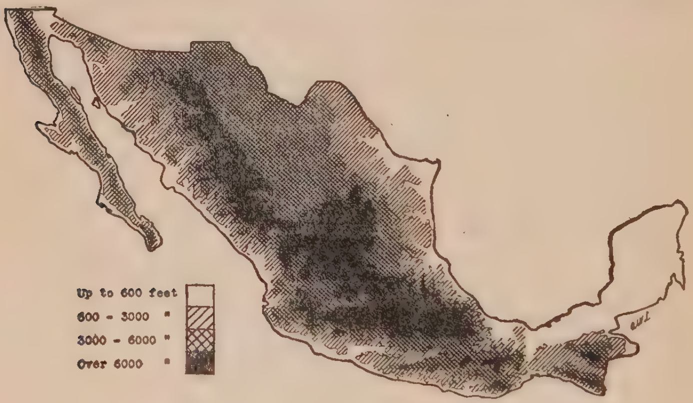

Fig. 45. Topography of Mexico.

barrier from tidewater to passes 8500 to 10,000 feet high, one descends, not to vales of equal depth on the other side, but to a lofty plateau country that dips gently from 8000 feet above sea level in the state of Puebla to 3000 feet toward the northern boundary.

It is on the high plateaus, of course, where the temperature averages about sixty degrees, that corn, wheat, potatoes, beans, cattle, and other products of the temperate zone are raised. Coffee, grapes, tobacco, etc., are grown on the mountain slopes facing toward the hot coastal lowlands. This "tierra caliente" yields sugar, cotton, rubber, cacao, oranges, bananas, fibers, etc.

Everywhere the soil is fertile, often to unknown depths, yet of her total area — 767,000 square miles, three quarters the size of Argentina — not over 5% is at present suitable for agriculture. Seventy-five per cent of Mexico is a desert.* For although the V-shaped conformation of her topography would lead one to expect the plateau region to be one vast garden, well watered by a great river system flowing northward down the slope of the plateau, and fed by countless streams from the mountain sides, the soil is so porous that it immediately absorbs all moisture. Rain toward the northern part is irregular and concentrated, short but heavy downpours after long periods of drought, for the prevailing east and northeast winds precipitate most of their moisture on the seaward side of the mountains. In the northwest, there is a rainfall of only five to thirteen inches per annum.

To make this whole region flourish, as well it might, extensive irrigation will be necessary. Close to the mountains streams may furnish water before they hide themselves beneath the surface. In many places the ground water is not very deep and can be reached by pumps or artesian wells. Generally, however, great storage reservoirs to catch and hold the rain will be necessary on a scale only possible for large capital or government enterprise.

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* A third of Mexico's population lives in about 5% of her area around Mexico City, a density of 100 persons per square mile. Including country immediately adjacent to this center of concentration, 70% of the population lives on a third of the area, density 30 per square mile.

The minerals are found in the mountains, where the soil is thin and the mineralized rocks have been uplifted and exposed, throughout the length and breadth of the nation. The region in which the most important mining districts exist is about 1600 miles long and 250 miles wide, extending from the state of Sonora to Oaxaca. The most famous and extensively worked mines are chiefly on the western slopes of the eastern Sierra. The ores are characterized by abundance, variety, and wide distribution, however, rather than by great richness of metal content. Although bonanzas are to be found, Mexico will have to encourage enterprises using modern machinery and equipment capable of handling low-grade ores, for the best development of her mineral wealth in the future.

Petroleum

The resources of Mexico of chief interest to the United States, representing two thirds of her total exports to us, are petroleum, silver, copper, and sisal fiber. So much advertisement has been lavished on Mexican petroleum (whence comes practically all our imported oil), that few people are not aware of the wonderful progress attained in this field. A Boston ship captain was the pioneer in 1876. He failed to obtain sufficient financial backing, however, and extensive development was postponed until 1900. Then it began with a rush, for next year the great gusher Cerro Azul No. 4 "came in," bursting forth in a column of oil 600 feet high, deluging the vicinity with about 750 gallons a minute for ten days before it could be capped (over 260,000 barrels in the last twenty-four hours).

In 1906, according to official statistics, Mexico's oil production reached a million barrels; in 1908, three million; in 1911, fourteen million; in 1918, when Russia's production was curtailed, Mexico became the second largest producer in the world; in 1921, her output of 195 million barrels was 25% of the world's total — well over double Russia's highest attainment and almost fourteen times her own production of ten years before. And this, moreover, was the yield of less than 300 wells, to be compared with a somewhat lower yield, 180 million barrels, in the United States in 1908, from over 140,000 wells.

This much may be pretty generally known, but the real importance to the United States of Mexican petroleum is

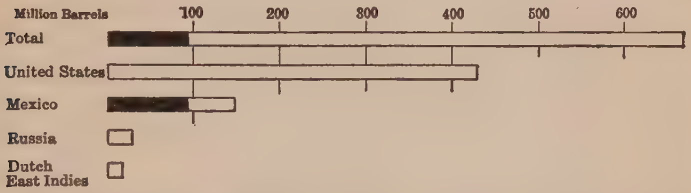

Fig. 46. Petroleum-Producing Countries of the World, and United States Petroleum Imports.
(Showing the total output of each country, average annual, 1919/21; and the portion imported by the United States, in black.)

not so well appreciated. It is not a matter of present production figures. The United States produces 60% of the world's output, but we *consume* at least 75%. Our enormous domestic output is insufficient for our own needs. Yet according to the best estimates of geologists, our remaining reserves, about nine billion barrels, will not last us twenty years longer at our present rate of production, to say nothing of increasing consumption and the application of petroleum for new uses. Petroleum is not a commodity susceptible of indefinite increase. Statistics have lulled many into the comfortable belief that we may continue to produce forever. But "mineral oil," as its name implies (petra = rock, oleum = oil), is a mineral, and like all minerals it occurs capriciously and in irregular and limited quantities.

While our reserves are being depleted, our dependence upon petroleum is increasing. This is quite appalling, when we consider the uncertainty of our supply. Automobiles are no longer a luxury. By facilitating the distribution of food supplies, etc., and thus obviating the necessity for overcrowding in the cities, the automobile and auto truck have immeasurably improved the health and efficiency of urban life. There are enough automobiles in the United States to supply one to every twelfth person, man, woman, or child. (Great Britain, following the United States, has one for every 110 persons.) Motor vehicles and tractors alone take 85% of our national petroleum production.

The wheels of industry and transportation would cease to revolve if we were deprived of lubricating grease. So essential is it that statisticians can judge the trend of prosperity by the sales of lubricating oils.

Only recently we have had forced upon our attention the importance of petroleum in war. Germany's unrestricted submarine campaign was dictated largely by the necessity of cutting off her enemy from their petroleum supplies. Her near success would not have been possible without the use of oil for her U-boats. The failure of her strategy was due to oil-driven destroyers, whose remarkable speed and flexibility broke down the morale of the undersea crews.

Liquid fire has petroleum as its base. "T. N. T." contains toluol, found in the heavier grades of petroleum. Food, guns, ammunition, soldiers are transported by the aid of petroleum. Aëroplanes and "tanks" are driven by mineral oil. Ambulances depend on gasoline. Ether and vaseline are petroleum products. Kerosene and wax candles give light at night in dugout and emergency hospitals near the front.

The first request for our assistance after our entry into the War was for the immediate dispatch to French ports of American tank steamers then sailing in the Pacific Ocean. One of the greatest services we rendered was our prompt response to this appeal (promoted by the popular support of "gasless" Sundays), so that Marshal Foch was able to say that "no military operation of the Allies on sea, on land, under sea, or in the air was ever interrupted by lack of petroleum supplies."

Road oils, petroleum coke for electric battery carbons, kerosene for farm tractors, naphthas as solvents, all assist the arts of peace. But a résumé of the three hundred odd products of petroleum is not our purpose here. There is one use, however, that does deserve particular attention — of such fundamental importance that it may well be a prime element in determining the course of international history of the coming century: the use of crude petroleum as fuel for ships.

In a previous chapter we have noted the importance of Great Britain's coaling stations, scattered throughout the world along the highways of commerce, in relation to the development of her trade and the maintenance of her Empire. We have also referred to the masterly and far-sighted strategy whereby, in anticipation of the transition to the use of crude petroleum for fuel, she has obtained control over oil fields in Roumania and Russia, Persia, Africa, the Dutch East Indies, and Burma, in Mexico and South America, as well as those throughout her own vast Empire. These oil fields she will shortly develop to supply the bunkering stations for her oil-burning ships.

As the possession of these oiling stations will be of utmost importance to Great Britain for the maintenance of her commerce, similar possession of stations and control of oil fields by the United States will be equally vital for our own future trade development. That in the past we should have depended upon Great Britain to finance and carry our trade was in no way humiliating or uneconomic, while yet that trade was small and preponderantly with Great Britain herself. That such dependence should continue after we have become a powerful competitor of Great Britain in the markets of the world is entirely unthinkable.

Wherever else our commerce may spread, the Caribbean region, as we have seen, is of primary importance to us. Even before the War, these countries gave us 75% of their trade. Now that the region has been made one of the world's main highways of commerce, the focal point of all ships passing through the Panama Canal, how much more important is it for us to possess suitable fueling stations and readily accessible oil fields for our merchant marine. In addition, it must be remembered, our navy has passed to the oil-burning basis. It is essential that we should have oil stations for our war ships needed to protect the Panama Canal.

Such then is the significance to us of Mexico's petroleum. Mineral oil has become vital for our existence and for the maintenance of our standard of civilization: distribution of commodities, geographic specialization, concentration of population, large-scale agriculture, etc., depend upon it. Our defense on land and sea, and, specifically, defense of our Panama Canal interests, depend upon it. The promotion of our foreign trade depends upon it. The future greatness of the United States will rest largely upon our commercial policy and enterprise. History has proved that the stay-at-home nation gets nowhere and is speedily subordinated or conquered. China is an instance of the stay-at-home nation; Great Britain exemplifies the pioneer nation. Petroleum, then, may even be an element determining our future progress as a nation. At the same time, our oil resources, thanks to our mad extravagance, are rapidly nearing an end. They are already inadequate to meet our needs. In the future we must rely more and more upon supplies from abroad, particularly those of the Caribbean region.

The very magnitude of the economic importance of Mexican petroleum, both to us and to the British Empire, enhances the gravity of its bearing upon the political side. Complications arising out of the Monroe Doctrine loom upon the horizon. Great Britain's energetic policy aiming at the control of the world's remaining sources of oil supply greatly restricts the field open to American enterprise. Mexico favors British capital. Already British interests have obtained a firm foothold in the Caribbean region. American concessions are passing into British hands. Unless we can pursue an equally far-sighted policy, other concessions and enterprises begun by American initiative will follow. British "commercial statesmanship" as she calls it in herself — "dollar diplomacy" in others — the government aid, coöperation, and protection she has afforded her business men in their foreign undertakings, stand as an example which we should do well to imitate. Benefit to special interests does not, *ipso facto*, imply injury to the nation, any more than a fair commodity exchange should injure either buyer or seller. Both should gain. The test to apply is, not whether special petroleum interests benefit by government protection, but whether there is a net advantage to the nation as a whole. In the immediate instance we have seen that the alternative of *laissez-faire* may cause irreparable injury to the nation.

Silver

Whether the European financial and monetary difficulties might lead to international complications with relation to Mexico's silver similar to those that menace us in connection with her petroleum, we would not venture to predict. Paper is now the currency of Europe, but is altogether too fluctuating in value to be retained indefinitely. Somehow, some time, Europe must struggle back to a specie basis. Silver may well be required to serve as an intermediate step toward the gold standard. It enjoys most of the qualities that make gold so preëminently suitable as a medium of exchange: it is plastic, like gold, and can bear the impress of a stamp; it is more durable than gold; it is attractive in appearance and valuable in itself, apart from its use as money, by reason of its services in the arts, in surgery, etc.; there is a sufficient reserve supply in the world to make it fairly stable in value; and above all — from Europe's point of view — it is cheaper than gold. Prior to the War, two thirds of the silver mined was used in manufacturing and only one third for monetary purposes. In 1915, the proportion used for manufacturing fell to twenty per cent; in 1916, to fifteen per cent. It is very probable that for many years money requirements will continue to absorb most of the silver produced, and will exercise pressure for an increase of output.

Europe will naturally turn her eyes to Mexico,* for Mexico is the world's chief source of supply. The Rocky Mountains-Andes region contains probably 73% of the total world reserves of silver. Before her internal disturbances, Mexico used to produce (1909/11) 80 million ounces per annum, about a third of the world's output. Our production was 56 million ounces, or 24%. During the triennium 1919 to 1921, Mexico remained first, with an average output of 61 million ounces, 35% of the world total; and the United States was a close second, with 58 million ounces.

Although since the Spanish conquest Mexico has produced upwards of five billion dollars' worth of the precious metal, she still has enormous potentialities. Every state except Tabasco possesses silver in greater or less quantity. She is the only silver-producing country, except Australia, that mines silver for its own sake. In other countries it is a by-product of mining for copper, lead, or other metals. Only a sixth of Mexico's output is by-product silver. Of our own production not more than a third is still "straight silver." Many of our copper mines, yielding silver as a by-product, started as silver mines (*e.g.*, the Anaconda copper mines at Butte), for metalliferous veins are in general proportionately richer in silver near the surface. The other metals are less stable and more readily soluble than silver or gold and are carried away to be reprecipitated, perhaps, as a "secondary enrichment" in veins below. Thus as the surface ores are exploited, the metal content changes in its proportions from silver to copper, for example.

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* It is said that Japan, also, as part of her strategy, perhaps, looking toward the subjugation of China, seeks to control the Chinese silver market, and is busy building up large reserves.

Although the United States is herself the second greatest silver-producing country in the world, she has hitherto been the chief destination for Mexico's output. The state of Sonora, one of the most highly mineralized parts of the world, borders on Arizona, and Chihuahua on New Mexico and Texas. Silver from these districts finds its natural market in the United States. Until 1920, indeed, when petroleum took the lead, silver was our major import from Mexico, amounting to a third the value of our total imports. Americans have invested heavily in Mexican silver mines, and control over half the output of the country.

The present large producing centers, however, are beginning to decline in the richness of their ores. Further development will require still greater investments of capital. Railways must be extended to the less accessible regions. Modern plants for ore concentration and smelting must be built. American capital stands ready, but instead of trying to encourage enterprise, the Mexican government has forced contraction under heavy taxation. It has required by law that properties can be acquired by foreigners only upon the express stipulation that they forego entirely the protection of their own government. Investment in Mexico under present conditions is risky in the extreme.

Copper

Copper used to be our second greatest import from Mexico: 15% of our total imports (annual average, 1909/11). Three quarters of the capital invested in Mexican copper mining is American, and practically all her product is marketed in the United States. The chief mining regions lie near the international boundary, close to the copper district of Arizona. Mexican resources should be a natural and valuable supplement to our own reserves. The present output and known reserves of copper in Mexico give no idea of her future possibilities, owing to political turmoil and risk to life and property. She is now subordinate to Chile and Japan in production. Her greatest output reached 75,000 tons in 1918, as compared with a maximum of 94,500 for Chile in 1920 and 111,000 for Japan in 1917. Yet it is thought possible that under favorable conditions she might equal or even exceed her competitors, and stand second to the United States.

Sisal

Another of Mexico's major exports in which we are particularly interested is sisal. This is a coarse fiber extracted from the long, spiny, sword-shaped leaves of a cactus-like plant that grows in the state of Yucatan. Next to Manila "hemp," it is the most important fiber in present use for ropes and binder twines. It is shorter than Manila fiber, its strands being only two to four feet instead of six to ten, and is inferior in tensile strength, flexibility, and smoothness. The presence of "splinters" in so-called manila rope is an indication of adulteration with sisal. Sisal is more easily injured by exposure to atmospheric conditions than manila. Nevertheless, for cheap binding, for tying bundles of laths, shingles, cooperage stock, leather, nursery stock, baled cloths, etc., where it is to be discarded after having served its immediate use, sisal treated with pine tar is ideal. Since the invention of the self-binding reaper it has been found invaluable for tying grain sacks. This last use, indeed, has opened a veritable gold mine for Mexican sisal growers. In 1918, when the local government of Yucatan established a system of market and price control and world conditions were exceptional, the value of our imports of sisal exceeded the combined value of our imports of silver and petroleum. The producers of sisal are among the richest people in Mexico.

Mexico is virtually the only source of sisal fiber in the world, Yucatan the only source in Mexico, and the province of Progreso the best region in Yucatan. The plant has been introduced elsewhere, in Cuba, the Bahamas, Hawaii, India, British East Africa, but nowhere does it seem to thrive so well. Conditions in Progreso are peculiarly suitable. The plant likes semi-arid land. The rainfall is light and the limestone plain, honeycombed with caves, quickly carries off the surface water. Sisal requires little attention for its cultivation. It is planted during the rainy season, and thereafter all that is needed is to clear out the weeds once or twice a year. The first harvest can be gathered after the third or fourth year. The outside leaves yield the annual crop, fifteen leaves or so, over a period of six to twenty-five years.

Reference has been made to only the four chief commodities we obtain from Mexico. These, however, by no means exhaust the list of her products. Unlike most of the Latin-American countries we have studied, Mexico's prosperity does not depend entirely upon one or two. The fact that her four most important commodities amount to only about two thirds of her total exports is sufficient to indicate this. So far as her resources are concerned, Mexico has all the makings of a sound and well-balanced nation. What she needs is a people capable of exploiting these resources, and a government able to command the confidence of foreign nations. For all undeveloped countries have to depend upon more mature nations for capital and engineering talent.

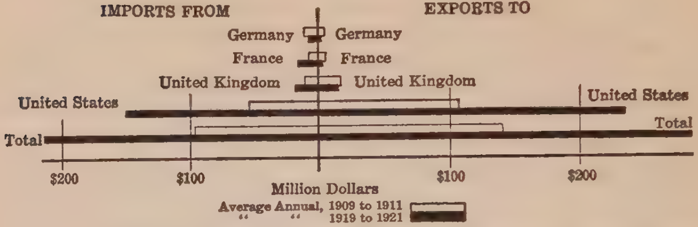

FIG. 47. Foreign Trade of Mexico, Annual Average, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

Mexico cannot expect to be an exception to the rule. But capital can be attracted only where there is some degree of assurance that it can be recovered, that it will not be expropriated or destroyed. Thus Mexico's problem is the same as that of the Central American republics: instability of her government and the character of her people.

Political Instability and the Character of Her People

From the days of the early Spanish conquest, in 1519, to her independence, Mexico has been a country populated by Indians and ruled by a small group of whites. It was with a mere handful of men that Cortez landed near Vera Cruz, scuttled his ships to prevent all possibility of retreat, plunged boldly into a strange country, and, fighting warlike native hordes on the way, finally penetrated to the capital city of the Montezumas, laid siege, captured and destroyed it, and placed himself as ruler over the Aztecs and their tributary tribes. The Spaniards who arrived in Mexico during the three centuries of slavery and oppression that followed came to loot, not to settle. The Spanish viceroys stayed only to exploit the country for the beloved gold and silver.

Nevertheless, this small proportion of whites has been responsible for a third element in the population, now greater in numbers than either whites or Indians: the mestizo.

As with most racial mixtures, the blend ~~of white with~~ Indian is not a happy one. The mestizo lacks the natural physical strength and endurance of the Indian almost in proportion to his white blood. He hates manual labor and turns to softer occupations. Yet he lacks the practical sense and ability of his white father, and his intellectual pursuits reach their height of accomplishment in idle theories. Proud of his white blood, he is arrogant toward his Indian cousin and ambitious for recognition as an equal by the whites, but his ambition is turned to hatred by consciousness of his own inferiority, ~~perhaps, and~~ by jealousy of the superior position of the white aristocracy. He desires only to clear them from his path, leaving him alone master of the nation. The mestizo supplies the restless, ever-scheming element of Mexico's population. Domestic revolutions are the natural expression of the fundamental race problem in the internal affairs of the nation, anti-foreignism, in external relations.

The Indian is the mestizo's tool. Whatever he may have been originally, the centuries of slavery under Spanish domination have left him docile and with a childlike desire for paternal care and guidance. Although he is perhaps the most teachable of all backward peoples, keen and active as a child and free from prejudice, he has been left in a condition of abject ignorance, with debased standards of living, innocent of self-control in any form, of concentration of effort, or of foresight beyond his immediate wants. The climate, which is too mild to stimulate energy, is too severe to yield an easy living. Since drought will destroy a large crop as well as a small one — and the loss will therefore be greater — he refuses to plant more than sufficient for his personal needs. Thus he is often the victim of famine. Undernourishment * conduces to apathy and an excessive

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* Trowbridge estimates that the daily rations of a peon contain about 2800 to 3000 calories, half the nourishment necessary to maintain vitality.

desire for stimulants; congested living, to neglect of hygiene, promiscuity and sexual overindulgence, large families, low vitality, continuous ill-health and disease, and high death rate.

Such is the tool of revolution, the Indian, and such is his restless, turbulent leader, the mestizo. Together they have determined the hectic history of Mexico during her independence. The small white minority, one time rulers, has played but a short-lived rôle. The revolution of 1810 started as an Indian uprising against the Spanish and creole (whites born in Mexico) elements of the population. The whites, who changed the course of the uprising into a struggle for independence, and who eventually carried that struggle to success in 1824, were speedily deposed by mestizo insurgents, who tossed their power back and forth among themselves for fifty years until Porfirio Diaz came. Diaz ruled the country from 1876 to 1880 and from 1884 to 1911. In ten short years since Diaz was deposed insurrection has followed insurrection, each starting in the north, Indian territory, and spreading southward until it has engulfed the central government — Madero from Chihuahua, Carranza from Coahuila, Obregon from Sonora, Zapata the Indian.

Diaz gave Mexico the only calm breathing space she has known since she won her independence. Although himself only three quarters white, the son of a Spanish father and mestizo mother, Diaz had the wisdom to attract about himself the white or aristocratic elements of the population. It was with their assistance that he was able to bring his nation out of its chaotic obscurity into a position of security and soundness new in its history. He put the government finances on a sound basis and succeeded in the scrupulous settlement of all national obligations. He encouraged industry, built railways, and established telegraph lines. He attracted foreign capital by special concessions of property and exemption from taxes, and inspired the confidence and favor of foreign investors by his energy and business-like administration.

So successful was the soldier-statesman in the regeneration of the country that writers assured the world that Mexico would never have to fear recurrence of those difficulties of the past, financial collapse, crippled industries, etc. "The fabric stands today self-supporting and indestructible, a living and lasting monument to the man who built it," wrote Percy F. Martin in 1907.

But Diaz had made one fatal error. He had neglected to improve and adapt the Indian to the new standards he was endeavoring to implant. While the mestizos (representing 55% of the population) were gaining a feeling of race consciousness, the Indian (33%) was left as he had always been, his slumbering discontent ever ready to be harnessed for the destruction of white civilization. The Diaz régime, while lacking the element of permanence and durability attending a hereditary monarchy, failed to build up for itself among the people a sound or intelligent support essential for the stability of a republic. Without either the one or the other, no government can long endure.

Even as Mr. Martin was extolling the "indestructible" handiwork of Diaz, it was beginning its downward career, and during the ten years following his deposition Mexico promptly returned to its natural state. Succeeding Diaz we have heard of Madero, Felix Diaz, nephew of the dictator, Huerta, who is thought to have murdered Madero and Suarez to seize the reins of government, Carranza, Villa, Zapata, Obregon. Wave upon wave of insurrection has swept down; government has trod upon the heels of government, each faction celebrating its few weeks or months of control by the execution of its enemies upon grounds of treason. Mexico became the scene of a wild ferment of destruction, rapine, murder, looting, and banditry; crops and live stock were requisitioned for roving soldiery; foreigners were seized for ransom, business corporations blackmailed; factories were closed, industry suspended. Starvation and epidemics succeeded. The work of thirty years was cast down in ruins. Where now is Mexico's credit? Her obligations have been dishonored, her financial structure ruined, her capital equipment impaired.

Prospects for the Future

In the constitutional provisions and legislative measures adopted by the new government, we find the same absence of practical sense so characteristic of the mestizo. The peonage system is an evil that should be corrected. The peon is virtually a serf, bound by indebtedness to a master who commands his labor until this indebtedness is wiped out. But the system cannot be changed by mere legislative decree. It is said to be the outgrowth of the improvidence of the natives themselves, who want to enjoy the reward of effort before they have expended any, and who thus reduce themselves to bondage. The hacendado is not anxious to tie up his capital by loans, but cannot obtain his labor in any other way. Similarly measures intended to improve the conditions of industrial workers promise little so long as they remain too ignorant to take advantage of them. High wages, the eight-hour day, "time work" in place of payment by the piece, possession of private property, all are blessings only to those who have the wisdom to use them properly for self-advancement, but when they are squandered and abused, they work in the opposite direction, and accelerate the debasement of the unfortunate "beneficiary."

The anti-white sentiment, expressing itself as anti-foreignism and anti-capitalism, has inspired a number of measures aiming to restrict foreign economic penetration and to break down great combinations of capital. To some of these efforts we feel a sympathetic response. We have had our own problems arising from the abuse of power by "big business" in the past. Such sympathy, however, should not blind us to the natural results of repressive legislation. The cost in Mexico is likely to be serious. The breaking up of the huge haciendas, whatever may be the ethical justice of the measure, is fraught with real menace to the nation. Although some of them were so large as to prohibit personal supervision and therefore could not be worked to capacity — one was larger than Costa Rica, or almost twice the size of Belgium — they were situated, for the most part, in the northern states, where the land is practically sterile, and where the small holder would be unable to gain a livelihood even if the land were distributed in lots. Large estates were rare in the south, where the rainfall is heavier (18 to 40 inches a year) and sufficiently regular to guarantee fair crops for the non-capitalistic farmer. The haciendas in the north furnished the organization and direction essential for the production of surplus food supplies. The Indian, with his traditional apathy, plants only enough corn for himself. The odds are against his harvesting even this. With the breaking up of the hacienda, the menace of famine on account of drought becomes only too real. Thus in 1917, there was a genuine famine in the north of Mexico due to drought. The people were saved only through the enterprise of Americans who, with the help of the Red Cross, imported and distributed carloads of American corn.

Diaz has been criticized for his generous attitude toward foreign capital and enterprise. Whether or not the concessions he granted were greater than necessary to induce capital to enter a country so ill-famed as Mexico was at the time, his successors have certainly reduced their nation to a position fully as difficult as that which confronted him.

Capital is essential for modern industry. As we have remarked, no undeveloped nation can dispense with assistance from without. Even if Mexico should elect to stay behind, the other nations would not permit her to do so. No nation, as no individual, is today sufficient unto itself. The civilized world would never tolerate such a sore spot in its midst. Moreover, the world needs Mexico's resources too badly to allow them to lie idle.

Even grant that Mexico is free to prohibit the entry of foreign capital, that she has a perfect right to stagnate if she wishes, she is not free to repudiate the obligations she already owes. She cannot denationalize at will the foreign capital which, at her own invitation, has crossed her borders. Her public debt has been estimated at over $500 million; foreign investments, almost two billions. British and American interests represent about $670 million each; French $285 million; German $75 million. Mexico is part of the world; she cannot evade her responsibilities.

The white aristocratic régime has been banished from Mexico. The mestizo has again seized the reins of government. Can he this time pass beyond the visionary, the theoretical, to the practical? Can the mestizo build a strong, effective government without the aid of the white?

Even under the most sane and conservative government, however, no undeveloped country can progress without assistance of foreign capital, and Mexico has the additional task of restoring all that she has wantonly destroyed. She must again turn to whites and foreigners for assistance: to the United States, for Europe has little surplus to spare. Can the mestizo overcome his deep-rooted fear and antipathy for whites and, instead of driving them from his shores, try to attract them thither again? The United States is ready and anxious to return, but can the Mexican forget that this same neighbor once despoiled her, justly or unjustly, of almost half her territory?

And if the mestizo *can* bring himself to do these things, can he correct the one real defect of the Diaz régime? Whatever constitutional provisions may be made, the "boss system" is the inevitable attendant of "democracy" where that democracy is founded upon an ignorant and illiterate *demos*. Better an out-and-out dictatorship than the same thing masquerading in the garments of popular government. The dictatorship, however, lends itself too readily to tyranny and abuse of power. We return again to the starting point. Can the new government of Mexico, before all else, build for itself a solid, permanent foundation by educating its eighty-five per cent illiterate populace?

CHAPTER XI

CHINA

China appears an unequaled market for manufactures, but has she a surplus product for exchange? Population presses closely upon means of subsistence, forcing extreme economies in production and consumption. Closer acquaintance with the resources of China reveals not only their great variety, but room for expansion of agriculture and increased production by improved tools and methods, mineral deposits for exploitation and for use in manufacturing (for which also she has the other essential factors). A surplus for export, however, will compete rather than exchange with our goods — except silk, our second major import. China is peculiarly fitted for sericulture, and with scientific methods should vastly excel Japan. Thus China does offer great possibilities, but the weakness of her government and the universal practice of "squeeze" hinder her progress: evils to be cured only by external control. But by Whom?

A Potential Market for Manufactures?

"China is potentially the greatest market in the world, . . . an almost limitless field for sales of foreign goods." With her vast agricultural population of 400 millions, no other market so strongly stirs the imagination and fires the enthusiasm. The story is often repeated how the Standard Oil Company first opened up a market in China for its kerosene. The company's agent was directed to sell some cheap kerosene lamps which had been manufactured especially in order to stimulate a demand for illuminating oil. As soon as the first consignment of 500,000 lamps arrived, the salesman brought together several of the leading merchants of the first city he visited, and after exhibiting a sample of the lamp, turned to one of the merchants and asked, "Now, how many of these will you take?" "Oh, put me down for a couple of hundred thousand," he replied. "And I shall want 250,000," said a second. "Put my order at . . ." "But hold on, gentlemen," cried the agent, "we have only 500,000 here." He had to cable home immediately for a much heavier consignment of lamps, and China became a market for illuminating oil, using a hundred million gallons per annum, a market exceeded only by Great Britain, Holland, and Germany. A railroad built through some of the provinces of China would serve, from the day the first train is run, a territory as densely populated as Belgium or Holland — in Shantung, for instance, which has an average of 500 persons per square mile! In the United States, during the period of greatest activity in railway construction from 1860 to 1890, when each decade witnessed almost a doubling of the total mileage, the average population density in Illinois and Indiana (1870) was 45 persons per square mile; in Iowa, 21.5 persons; in Kansas, 4.5. Yet Illinois

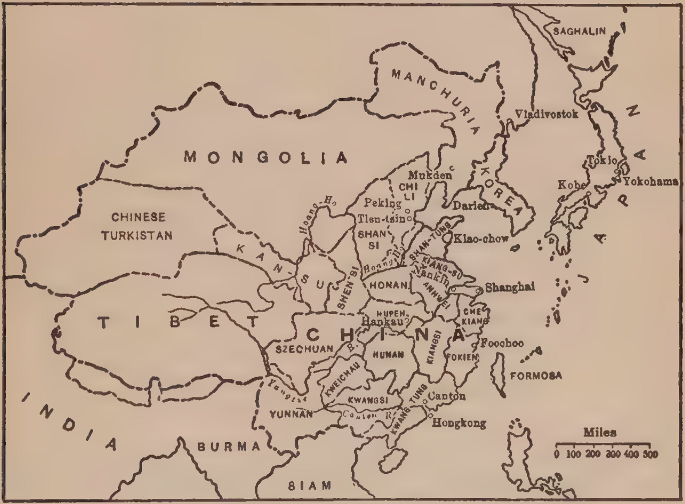

FIG. 48. China.

had nearly 5000 miles of road, Indiana over 3000, Iowa about 2700, and Kansas 1500. China has a total railroad mileage of 7000, with a population in many places over a hundred times more densely settled than was Kansas in 1870.

Pressure of Population on Subsistence

But unfortunately it takes more than numbers to constitute a good market or create a favorable opportunity for enterprise. The people must have purchasing power, a surplus of goods for exchange. China's enormous population is not the result of a geographic division of labor, as in the Western Hemisphere, whereby industry, which requires a large proportion of labor, is concentrated in certain districts and nations, and agriculture, which requires much space, and comparatively little labor, is carried on in the less developed regions. In China no industrial revolution has occurred. Her great population is maintained only by the practice of stringent economies to which we are totally unaccustomed. It is the simple outcome of centuries of ceaseless struggle to win subsistence from reluctant Nature, with methods of production practically unchanged, modified only here and there by minute economies.

Protected from aggression of barbaric peoples by barriers of lofty mountain ranges, deserts, and jungles, the Chinese have been able, indeed, to preserve from generation to generation every least improvement, and have thus by empirical methods discovered and put into habitual practice some economies that we are only just beginning to discover are possible. Western science has learned that certain kinds of plants, "legumes," attract to their roots clusters of bacteria which catch and retain nitrogen from the air, so that if the roots are left in the ground the nitrogen also remains to enrich the soil. But the Chinese have long been practicing rotation of crops, planting beans, peas, or clover before their non-leguminous crops, such as wheat, millet, sorghum, etc.

We scarcely yet appreciate the possibilities of utilizing for fertilizer the nitrogen in organic refuse, garbage, sewage, of our large cities. We throw away annually in sewage alone from two to four hundred thousand tons of nitrogen, a hundred thousand tons of potash, and fifty to a hundred thousand tons of phosphate; we not only waste all this, but we tax ourselves large sums to do so! The Chinese save and return to their fields every least scrap of refuse. Large stoneware storage receptacles are everywhere to be seen. Manure boats ply regularly throughout the year from Shanghai and the other cities to the farms.

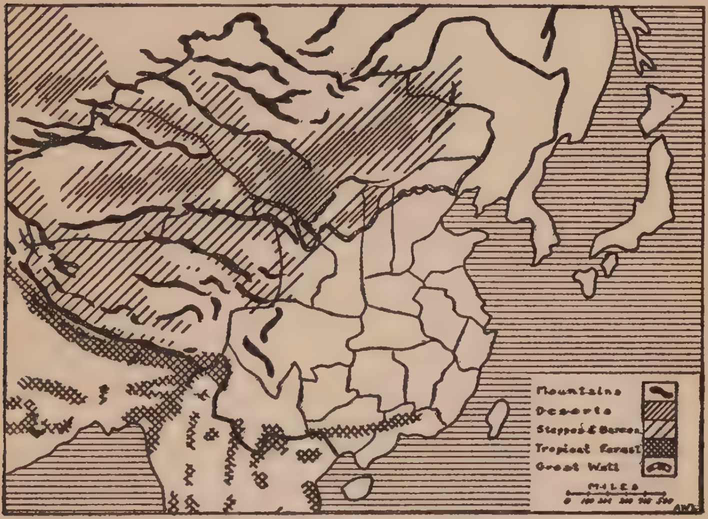

FIG. 49. The Natural Defenses of China.

Most crops require three to six hundred tons of water per ton of product. It is a matter of prime importance, as every farmer knows, that the crops should receive the right amount of water and at the right time, if soil is to yield to capacity. To insure the utmost productivity of their valuable land, the Chinese have employed irrigation these many centuries. Today China has fully 200,000 miles of canals, to say nothing of thousands of miles of irrigation ditches. Imagine about eighty canals stretching across the United States from the Atlantic to the Pacific Coast in parallel lines only eighteen or nineteen miles apart, and you can get an idea of the canal mileage in China.

Much of China is mountainous or hilly. Cultivation on hillsides leads to speedy erosion. The rain carries away the loosened soil to the valleys and down to the ocean. The Chinese, however, have learned to build terraces, like steps, varying in height according to the steepness of the hill. Each step is almost level, but slopes very gently outward to afford drainage. A rim or low ridge along the edge collects the sediment, which can be returned to the surface when desired.

In consumption as well as production the most minute economies are practiced. Vegetarianism is considered rather a fad in the United States, but European countries, particularly Holland, Denmark, and Belgium, eat much less meat than we do, while China, Japan, and India use it simply as an appetizer to flavor their food. Fish are bred in the canals, or rotate with rice when the fields are flooded. Frogs' legs are delicious (it remains for some enterprising person to find means to export them). Practically the only live stock kept by the Chinese in the densely populated parts are hogs and poultry. Both of these are scavengers, eating what man does not eat, and therefore not competing with him for the food supply. Ducks can feed in the shallow ponds, and thus do not compete even for space to live. Pork yields the greatest food value of any kind of meat, and the egg enjoys the rare quality of being almost entirely digestible (97%), one of the most highly concentrated of foods. Both swine and poultry multiply with great rapidity. In twelve months a sow may produce eight offspring, which will have attained two hundred pounds weight apiece, and a second litter of eight, which will have reached a hundred pounds each — a total of 2400 pounds. Hens have been known to lay over three hundred eggs in a year. These are unusual records, of course, but they are sufficient to show why the Chinese have chosen swine and poultry as their live stock. In place of extensive meat eating, the Chinese find their necessary protein element of diet in vegetables and nuts. Upwards of five hundred distinct plant species are used for food, some that we regard as weeds. No similar list could be compiled in any Western country. Rice, which is the "staff of life" for the Chinese, gives a yield per acre over double that of wheat and 50% more than of corn. In the southern sections of their country, the Chinese have anticipated us in the discovery of the food value of the banana, which we are just beginning to appreciate. But the king of all is the soy bean. This humble garden vegetable contains 20% of oil, and three times as much protein as wheat. With rice to take the place of bread, the soy bean supplies the protein of meat and the fat of butter: a complete meal.

With these and numerous other economies the Chinese utilize to the limit every least element of their environment and resources. Space and time are squeezed to the utmost to yield support for human life. With such evidence before us, would it be reasonable to expect China to produce a surplus for exchange? But before we admit on such general grounds that China has no purchasing power, and our hopes of finding in her a market are delusions, a closer survey of the resources of the country may yet reveal unexpected possibilities of increased production.

The Resources of China

China comprises China proper, or "the Middle Kingdom" as it used to be called, and the outlying dependencies of

Manchuria and Mongolia toward the north, Tibet on the lofty plateau toward the west, and between Mongolia and Tibet, Chinese Turkestan. China proper is about half the size of the United States (1.5 million square miles) and is inhabited by perhaps three times the population (though all statistics are merely rough estimates). The dependencies together cover an area half as large again as central China, but, except for Manchuria, they are thinly populated. Mongolia and Turkestan have only two inhabitants per square mile and Tibet about fourteen. Lofty mountain ranges and vast stretches of desert characterize these regions. Our interest lies in the more accessible parts of central China and Manchuria. So varied are the characteristics and resources even of China proper, however, that a detailed survey will be necessary.

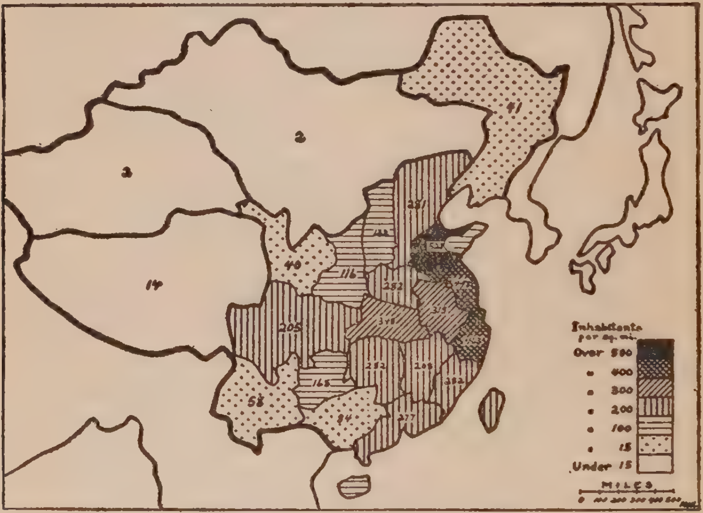

Fig. 50. Distribution of Population in China.

For convenience, we may divide China proper into three great physiographic regions, based upon the three river systems that flow eastward across the country from the western mountains to the ocean. The Yellow River, or Hoang-ho, and the Yangtse River both rise in the remote Tibetan plateau, but the former empties (about 100 miles from Tientsin) into the Gulf of Chihli toward the north, and the latter reaches the Pacific Ocean, or more properly, the East China Sea, about midway on the great curve of China's coast, near Shanghai. The Canton River, or Si-kiang (West River), rises in southwestern spurs of the Tibetan plateau, and reaches the China Sea near Canton, on the southern bend of the coast. The basin of the Canton River is separated from the rest of China by mountains that extend down to the sea coast in the Province of Fukien, south of Shanghai.

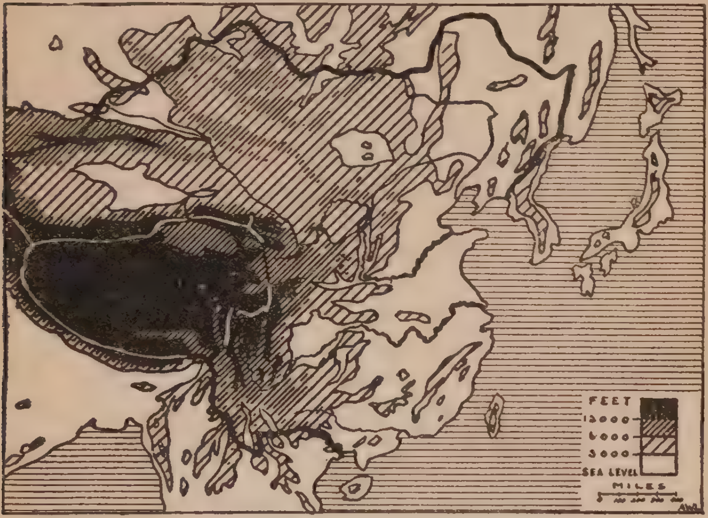

Fig. 51. Topography of China.

The northern region, traversed by the Yellow River, consists of six provinces — from the coast inland, Shantung and Chihli, Honan, Shansi, Shensi, and, most remote, Kansu. The eastern promontory of Shantung * is mountainous and comparatively barren, but behind the mountains lies the great alluvial plain of the Yellow River, extending southward, where as recently as 1887 the river took its course to merge into the delta and alluvial plain of the Yangtse River, and northward into Chihli, where it merges into what used to be the floor of a shallow inland sea, an extension of the present Gulf of Chihli. This low-lying country, as may well be imagined, is extremely productive. Wheat, millet, beans, peas, peanuts, and temperate fruits are grown. Honan is especially reputed for its cotton. So densely populated is the entire region that it is not self-supporting. Nevertheless, it might well be rendered more nearly so by the adoption of modern implements and the application of Western science, as for instance in crossing varieties of wheat to produce a larger ear. Both provinces of Chihli and Shantung, moreover, have coal reserves, and iron is mined in Shantung.

The greater part of Honan ("South-of-the-River") is also a fertile plain, though we reach the mountains in the western part. The Yellow River, as it flows through Honan, has the appearance of a high railway embankment rather than a river. The faulty practice of building levees, instead of digging the channel deeper as it fills up with silt from the hills, has gradually raised the river some fifteen or twenty feet above the surrounding country. There is constant danger, periodically realized, of floods overflowing the embankments and destroying the crops over hundreds of square miles, with famine as a sequel. The correction of this evil by engineering enterprise might not afford a surplus of production, but it would at least enable the region to support

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* Shantung is the final resting place of Confucius, and the present home of his descendants, to the 76th generation — the oldest pedigree in existence.

itself without recourse to food supplies of other sections of the country.

The soil in the valleys of Shansi is very fertile, of the famous "loess" formation. This is a deposit of fine dust swept from the dry interior plateaus of Mongolia by the northwesterly gales prevailing in the winter.* Year by year the dust covers the grass and other growths and gradually buries them. As they decay they form a rich porous loam of very great fertility. In the course of ages, the loess has filled up the mountain valleys to the depth of many thousand feet.

The mountains have been recklessly deforested, so that in the rainy season, unchecked torrents rush to the plains below, cutting deep ravines in the soft soil and leaving the surface barren. In the dry season, any rain is quickly absorbed, leaving even the stream beds dry. The life of the country is carried on in the ravines, even the dwellings being excavated out of the lofty cliffs. Reforestation might do much to restore the agricultural prosperity of the region, and perhaps irrigation works on a very large scale — irrigation by primitive methods being impracticable.

But Shansi has other resources of more immediate promise. Great deposits of both iron and coal occur close together in the mountains. These may well form the basis sometime for a flourishing steel manufacturing center. The coal seams reach forty feet in thickness and, lying horizontal, are easily accessible. They are said to form the greatest coal deposit in the world.

Shensi, still further west, was once the granary of the empire and the birthplace of Chinese civilization. The fertile loess covers most of the northern part of Shensi and the greater part of Kansu, but its productivity here also is immediately dependent upon rainfall. In the midst of potential fertility the menace of famine looms ever present. The population density of the two provinces stands below that of nearly all the other provinces of China, and here cattle and sheep are raised more extensively than elsewhere. Reforestation and large irrigation enterprise may make the region again the granary of China, although difficulty of access will postpone recovery for many years to come.

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* In the summer, the land is warmer than the sea. The air over the land rises as it becomes heated, and the cooler air from the sea sweeps in to fill its place. Thus the prevailing winds of summer are southeasterly. In winter, when the ocean is relatively warmer than the land, the reverse occurs, and the prevailing winds are from the northwest.

The central region, or Yangtse River basin, is commercially more important than the northern section. On the great alluvial delta formed, and still forming, by the annual deposit of five billion tons of silt, is situated the province of Kiangsu. With its soft, mild climate tempered by constant sea breezes, and watered throughout the year, intersected like Holland by countless canals and irrigation ditches, Kiangsu is perhaps the garden spot of China. Silk is its most valuable product, superior in quality and quantity to the product of any other province. Next in importance is cotton. Rice is exported. Innumerable other subtropical crops are raised.

The Yangtse meets tidewater two hundred miles from the mouth. Above this, the alluvial plain, broad in some places and narrow in others, extends inland a thousand miles, covering a large portion of Anhwei (Nganhui) and Hupeh. Kiangsi and Hunan are traversed by tributaries of the Yangtse, which in their lower reaches have also formed plains that join with that of the larger river.

Anhwei boasts the richest rice-producing region of China, near the treaty port of Wuhu, about 250 miles up the Yangtse. The southern section is also famous as the green tea center, whence comes most of the tea exported to the United States. "India" ink is made here, from the soot of burnt oilseeds of the tungtse tree which grows in this region.

Hupeh is less productive. The mountains are denuded of forests and are now barren. Nevertheless cotton and tea are grown, eggs are exported, and also coal, though of a quality inferior to that from other parts of China.

Kiangsi and Hunan, lying south of the river, are mountainous, each formed like an amphitheater with a lake in the center. The tea of Kiangsi is said to be the finest in the world. The white clay or "kaolin," a word derived from the local name of the mountain range where the clay is quarried, supplies the whole of China with rice bowls. The only similar deposit in the world is that in England. Hunan grows rice about its central lake, and in terraces on the hillsides. The monsoon coming up from the China Sea supplies plenty of water. Oilseeds, hemp, and tobacco are grown and exported. Tea from Siang-tau above Chansha is shipped via Hankow to London. There are said to be valuable deposits of tin in both provinces.

It is from the mountains in the western part of Hupeh that the Yangtse River first emerges upon the great plain through which it flows to the ocean. For two thousand miles in its upper reaches, with the exception of the little Chengtu Plateau, it rushes through narrow gorges and ravines no wider than its bed, among the lofty mountains of Szechuan, 8 to 10,000 feet in height.

Nestling among the mountains is perhaps the most highly productive and densely populated district for its size in the world, the Chengtu Plateau or "Red Basin." On three thousand square miles of area it supports an agricultural population estimated at more than 2000 per square mile! Centuries of careful irrigation, and the boldest and most elaborate engineering enterprise conceivable, have converted a stony, boulder-strewn waste into a garden. It is claimed that in its deep loam now grows every species of plant raised anywhere in China. It has a warm, subtropical climate, no winter, a moist atmosphere, and such constant, drizzly rains that "dogs bark when the sun shines." The land is now almost twice as productive as ordinary irrigated land elsewhere, even in China. As many as five crops of varied produce can be obtained on some farms in one year. Rice land here can produce four or five tons per acre as compared with two or three tons on land even of the best anywhere else, and is worth 75% more.

Many varieties of drugs are collected from the trees and shrubs that clothe the slopes of the surrounding mountains. Coal of excellent quality underlies the entire sandstone formation of the Plateau, and is exposed in many places along the sides of the river gorges. Iron, copper, petroleum, and other minerals are also reported as present in quantity throughout the province. Yet dangerous rapids make navigation of the river hazardous, and until a railroad can be built — an exceedingly difficult and expensive engineering proposition — all these vast resources must remain buried to the world!

Chekiang and Fukien are two provinces that do not properly belong either to the Yangtse Basin or to the Canton River or southern district. Their rivers drain directly into the Pacific. In climate and products, however, they might be placed with the middle region. Separating the provinces from Kiangsi is the mountain range, Wu-yi-shan, pronounced Bu-i, thus giving the name to the celebrated tea, "Bohea," grown upon its slopes.

Both provinces are mountainous, though Chekiang less than Fukien. Chekiang, like Szechuan, is self-sufficient, producing every requisite for food and clothing. Every hill throughout the province is cultivated or covered with valuable forest trees. Fukien is more rugged. The river Min, famous for its beautiful surroundings, has impressed its character upon Chinese art: the familiar steep mountains, lonely temples on jutting ledges, etc. In the interior, the narrow steep valleys, difficult of access, yield barely enough subsistence for the inhabitants. They are a rude and hardy people, the least educated of all the peoples of China. In bravery they stand in striking contrast to their effeminate neighbors of Chekiang and Kiangsu.

The southern section or Canton River Basin reaches the tropics, about as far south as Cuba. The mountains are healthful, but the river valleys and ravines are malarial. The farmers live on the hills and descend daily to their farms deep in the gorges. Four provinces lie in this region: Kwantung, Kwangsi, Kweichau, and Yunnan. Kwantung is the most important. The rich soil of the Canton River plain and delta is very fertile and well watered by the monsoon rains. Rice is the principal crop, but silk, cotton, sugar, subtropical fruits, and numerous other products are raised. Coal and iron are known to abound. Industries flourish in Canton, and the inhabitants are notable as the ablest and most enterprising merchants of China. Ninety-five per cent of the Chinese that come to the United States are Cantonese.

Kwangsi, further inland, is mountainous, thinly settled by a somewhat turbulent population. Here was the source of the terrible Taiping Rebellion of 1849–65. Great mineral wealth is reported, but very little definite information exists, and little has been done to exploit it. More remote still is Kweichow. Although it is more rugged than Kwangsi, the people are more thickly settled. Owing to the natural beauty of its mountain scenery and the independent character of its inhabitants, it has been styled the Switzerland of China. Here also mining seems to promise well for the future. It is claimed by some writers to be the richest in mineral wealth of all the provinces of China. Yunnan is most remote of all, being really a southeast extension of the Tibet Plateau. Next to Kansu at the far northwest corner, Yunnan is the most sparsely settled province in China proper. Although it lies in potentially the richest agricultural section of China, the menace of marauders, the bad government of its local officials, whose sole aim is to squeeze the utmost tribute from the country, and the difficulties of communication, prevent the prosperity of which it is capable. Tin mines have been worked for many years, chiefly for domestic consumption, but efforts to develop them on modern lines have proved unsuccessful.

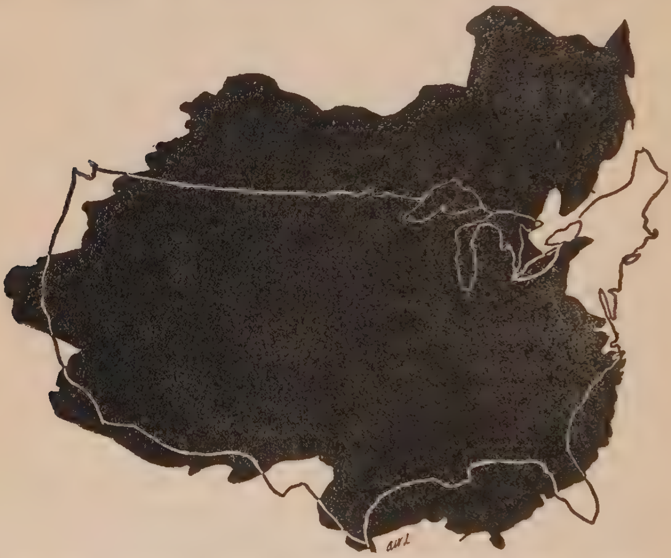

FIG. 52. Area of China. (Compared with the United States.)

From this hasty survey, our customary conception of China as an expanse of water-soaked rice fields, with junks lazily floating on canals, of densely crowded humanity, of tea and silk, is replaced by pictures, kaleidoscopic in variety, of characteristics and resources not yet exploited and hardly to be excelled elsewhere in the world. The popular ideas have been drawn simply from districts close by the ports of Tientsin, Shanghai, and Canton. China's agricultural resources are better than those of the United States. Her mountains contain incalculable mineral wealth.

But even where the population is densest, production may be increased. Western science can teach the Orient methods whereby, with the use of better tools, etc., larger crops may be obtained. Although China is the third greatest cotton-growing country in the world (2.5 million bales as compared with the United States, 13 million, and India 4 million), her yield per acre could be multiplied two or even three times. Reforestation in Shansi, Shensi, Hupeh, etc., might restore to productive use the fertility of the soil, especially in the loess region. Kwangsi and Yunnan, endowed with climate and soil ideal for agriculture, await only improved communications and a wise policy of encouragement to enterprise. The agricultural resources of China have reached their limit only with the methods and equipment at present in use; with the application of Western science, they are still capable of yielding an abundant surplus for export.

The Factors of Industry

These considerations, however, are confined to possibilities of agricultural expansion. The mineral resources of China, though exploited in a small way for centuries, are practically virgin. The extensive use of minerals and of coal is distinctive of modern industrialism, capitalistic production. China is still agricultural. The million persons living upon Chungming, an island of 270 square miles in the mouth of the Yangtse River (3700 persons per square mile), are almost all farmers. Shanghai and Canton are manufacturing centers, but elsewhere the population lives upon the soil. Yet coal occurs in every province. Manchuria is said to be one vast coal bed. Shansi, Chihli, Shantung, and Honan are reputed as the richest. Shansi is superior to Pennsylvania in anthracite. Estimates of China's total coal resources are placed at 1500 billion tons, double as much as Europe's, and enough to supply the whole world at the present rate of consumption for a thousand years. Iron occurs close beside the coal in Shansi, in Chihli, and in Hupeh. Nothing but good roads and means of communication are needed to place China on a competitive basis in the world's markets. Before the War (1913), indeed, Chinese iron could be laid down in San Francisco for $10.78 beside Pittsburgh iron at $21. Other metals are found. Copper occurs; her antimony production already amounts to 50% of the world's output (though practically untouched before the War); her tin about 10%, third largest in the world; her real reserves of tungsten have not been touched, though the most easily accessible have been exhausted; evidences of petroleum are reported.

But China's possibilities for production of a surplus for exchange are not confined to foodstuffs and raw materials. She is liberally endowed with the other essential factors for industrial development. In addition to coal and iron, the basis of modern industry, she has a labor supply unlimited in numbers and of excellent quality. South America has great mineral resources, but she must wait for a labor supply before she can properly exploit them; China has not only the resources, but the labor as well. The popular conception of Chinese labor is of weak, anemic specimens of humanity. This idea may be connected with their vegetarianism, their Confucian pacifism (the doctrine of Christianity put into actual practice), or perhaps their flowing trousers and shirt tails, and their long hair. As a matter of fact, the Chinese are naturally strong and healthy, industrious, patient, cheerful. Their endurance is wonderful. A Chinaman can do the physical work of six white men, and suffer hardships that would kill a European in a few hours. He starts work before sunrise, and finishes after nightfall. He is docile, intelligent, and readily adaptive. Although economic conditions have never wrought an industrial revolution in China, the mechanical instinct is not wanting, and the great engineering achievements of past ages show that it is only dormant.

These qualities of the Chinese are the result of generations of an existence where laziness or stupidity must mean sure starvation. At present the use of opium, promoted by Western commercial interests, and the spread of diseases such as malaria, hookworm, and tuberculosis, have lowered their vitality, but these are evils that may be reduced by education and medical science. The iron workers at Hanyan, the center of a modern steel industry where railway equipment, locomotives, guns, automobiles, etc., are being manufactured, are fast becoming equals of our Pittsburgh labor. The hostility of Americans and Europeans to Chinese immigrants is in itself eloquent testimony of the potency of Chinese competition.

Contrary to general impression, even capital is not lacking in China. Poverty stricken as the people are, they have been accumulating bit by bit through generations treasure which in the aggregate would be astounding. Each family has its little hoard carefully secreted under some stone or in some hidden drawer. It is believed that, given sufficient inducement, the Chinese could produce a billion dollars at any time. At present this capital is not available because conditions in China are not such as to create confidence or guarantee the return of funds invested. Facilities for the formation of joint stock companies are wanting under Chinese law. Such native capital as may seek investment is generally placed in foreign enterprises, where it enjoys the advantage of foreign protection. Some day, however, this vast hidden reservoir will be released for productive use.

A Surplus for Exchange with the United States?

There is no doubt that China can produce a surplus; the only question is what she can produce to exchange for American goods, what she has that may be wanted by the United States.

Agricultural commodities, of course, stand first among her exports; but situated in the same latitude as the United States, Hongkong on a line with Havana and Mukden on a line with New York City, there seems to be little chance for permanent exchange upon an agricultural basis. In 1920, China's chief export consisted of bean products (beans, bean oil, and bean cake) amounting to a seventh of her total exports, and consigned mostly to Japan. China might do better to retain these to support her own population. In any case, they promise little as a basis for exchange with the United States.

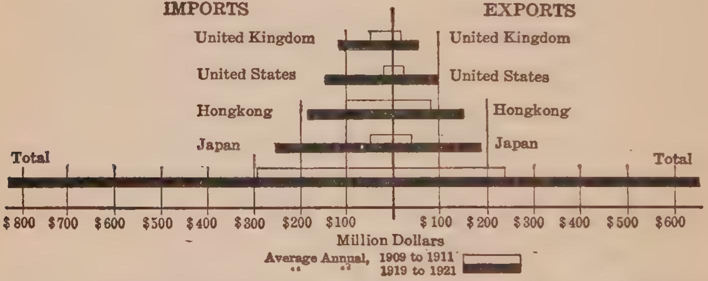

Fig. 53. Foreign Trade of China, Annual Average, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

Silk is the second major export from China, 8.5% of the total exports in 1920; but although China was the original source of silk, most of our imports, three quarters or more, come from Japan. Wheat and wheat flour almost equaled her raw silk (8%), consigned from Dairen to Turkey, Persia, the United Kingdom, etc. Eggs and egg albumen represent 4%; Sesamum and tea represented 2% and 1.5%. China tea is noted for its peculiarly delicate flavor and is less injurious than teas from Ceylon, India, and Japan; but the United

States is not a tea drinking country. Our annual consumption amounts to about 1.30 pounds per capita as compared with Australasia, 7.5 pounds, or Great Britain, 6.47 pounds.

The United States is abundantly supplied with most mineral resources. China's coal (2% of her exports, consigned to Japan) is of no interest to us; her iron reserves are inferior to our own. Her tin, indeed, may become a valuable commodity for exchange, but not for many years, and then hardly of sufficient importance to afford a broad enough basis for exchange. If China turns to manufacturing, she will compete with our industries, possibly to our great disadvantage with her boundless labor supply.

Silk

It is her cheap labor supply, however, that, at least for a long time to come, may furnish the difference necessary as a basis for exchange. Silk production requires just such an abundant supply of very cheap labor. Both the mulberry and the silk worm can readily be grown throughout a large part of the United States, but every attempt to establish the industry here has proved commercially unsuccessful. The process requires too much painstaking attention. The industry is entirely unsuited to a country where labor is scarce and expensive.

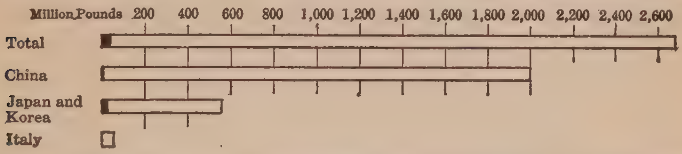

FIG. 54. Silk Producing Countries of the World, and United States Silk Imports.

(Showing the total output and the output of each country, average annual, 1919/21; and the portion imported by the United States, in black.)

Although we now buy most of our raw silk from Japan, China has far superior possibilities. Silk is produced throughout the length and breadth of the country — and China's area is over ten times that of Japan; her population more than six times as great. No one knows what China's annual silk production is, but one estimate has placed the output at two billion pounds (1914). The average for Japan during the years 1919–21 was 545 million pounds. Our preference for Japanese silk is on account of Japan's more rapid progress in the improvement of the processes and adaptation of the product in weight, strength, and uniformity to American machine requirements, and the rigid enforcement of standard specifications. There is no intrinsic reason why China should not be able to produce silk of equally good quality. Her best grades, indeed, are said to be unsurpassed in textile strength and durability.

Our consumption of raw silk is practically doubling every decade, and in 1919 reached a total value of $342 millions ($438 millions during the fiscal year July 1, 1919, to June 30, 1920) — our second greatest article of import.

U. S. Imports of Raw Silk

(Fiscal years)

1879/81	average	2.7 mil. lbs.
1889/91	"	6.1 mil. lbs.
1899/01	"	10.7 mil. lbs.
1909/11	"	21.5 mil. lbs.
1919/21	"	41.6 mil. lbs.

The silk industry in China is carried on in the cottage, from raising the worms to weaving the fabric. Where the industry is more advanced, however, as in Japan, each step has become specialized, and the factory has encroached more and more upon the cottage, taking over first one step and then another. One stage only still clings tenaciously to the cottage.

The first step, which relates to "seed" culture, has be-

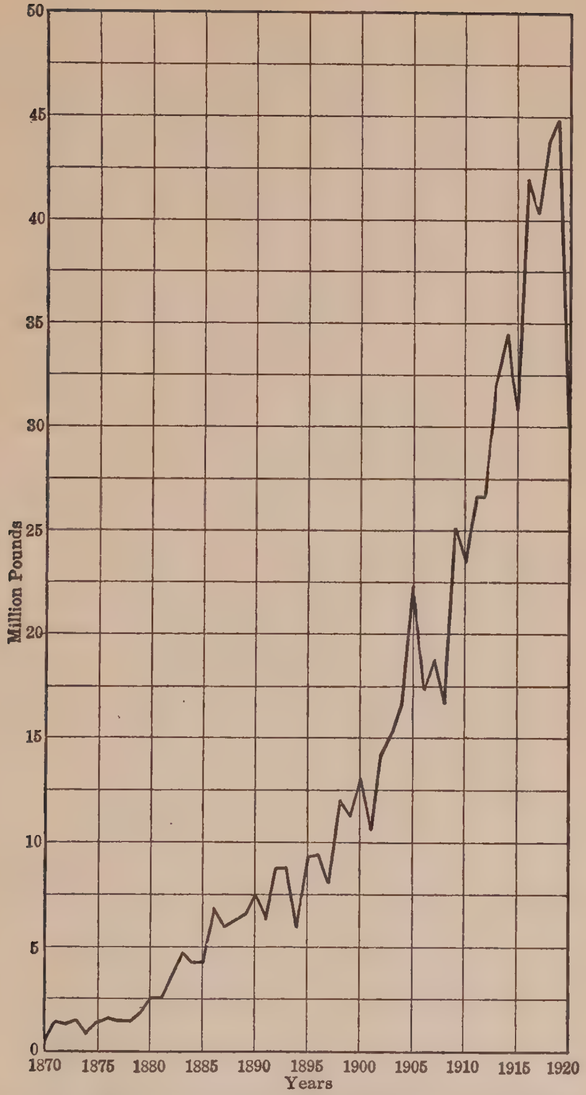

FIG. 55. Silk Imports into the United States, 1870 to 1920.

come a function of government experts in Japan, Italy, and France. The experts make a careful selection of the best seed, as the silkworm eggs are called, and keep them in storage until they are wanted for hatching. The quality of the seed and their freedom from disease determines the output of cocoons. In China where the cottager still attends to this himself, it is estimated that 75% of the silkworms hatched die before they reach the cocoon spinning stage — an appalling economic waste.

It is the second step, however, that seems to belong properly to the cottage: the period from the hatching of the eggs to the spinning of the cocoons. The silkworm, like any healthy caterpillar, spends its time in devouring leaves, preferably the mulberry leaf, though the wild or tussah caterpillar of northern China that produces the yellow or pongee silk, lives upon the oak. Growing the mulberry tree is a purely agricultural process, involving questions of fertilizers, grafting, pruning, etc. Since it is possible with suitable transportation facilities to obtain leaves from a distance, this is not a factor necessitating development of the industry in one place rather than another. But the care of the worms, requiring the most patient and painstaking attention, is possible only where labor is plentiful and cheap. They must be fed five or six times a day with finely chopped mulberry leaves which should not be too damp or too hot. Hands must be washed before each feeding. The worms must be placed where they will not feel a draft. The temperature must be regulated, not too hot, not too cold; the atmosphere, not too dry nor too moist. The trays should be cleaned every day, an operation managed by spreading a leaf over each worm, and, as soon as he clings to it, removing it to another tray. Every caterpillar has to be watched. If some show, by their color, that they are getting ahead of the others, their food must be so modified as to check them. It is essential to have them all progress evenly.

In a month's time, when they have attained a length of about three and a half inches, they are ready to spin their cocoons. They indicate their desire to climb by raising their heads. Then trellises specially prepared with rice straw, must be placed to hold the cocoons.

What all this means will be better appreciated, perhaps, when we learn that it takes 2500 to 3000 cocoons to make one pound of raw silk. While this whole process is simple enough, requiring no skill beyond the capacity of a child, it is obviously one in which no advantage could be derived from a subdivision of labor or capitalistic production. Any attempt to increase the number of worms attended to by one person immediately results in a smaller yield, since it becomes impossible to bestow as much attention upon each worm. For silk culture to be economically possible, labor has to be so low paid that its main support must be derived from other occupations, while at the same time it must not be liable to withdrawal to these other occupations. In other words, silkworm raising requires the unskilled labor of the women and children of families forced to supplement the earnings of the husband, which in an overcrowded community are insufficient to support the whole family.

Succeeding steps are adapted to large-scale enterprise. The silk filament is the gummy liquid discharged from two minute tubes in the lower jaw of the caterpillar. It immediately hardens when exposed to the air. In four days the cocoon is completed, with 300,000 coils of filament measuring four to six hundred yards in length. In the natural course of its life the caterpilar would turn into a chrysalis and, in fifteen to seventeen days, burst from the cocoon for a twelve days' riotous life as a moth, during which it would seek a mate and lay its 350 eggs. As soon as the cocoon has been spun, however, the chrysalis is killed by steaming, for the hole made in the cocoon by emergence of the moth breaks the silken strands. Such strands have to be combed and spun into thread just as cotton or wool is spun. This was probably the original procedure, but a much stronger thread can be obtained by securing the cocoon before the hole has been pierced and by simply unwinding the long filament. The strands of several cocoons are passed together through a single small hole or eye. They adhere by their natural gumminess, and form a strong thread of uniform thickness — a thousand miles of single silk filament to a pound. In Japan reeling has been removed from the cottage to the "filature," where the silk can be cleaned more thoroughly, treated effectively by steam, and twisted better on reels driven at a rate of 80 to 100 revolutions per minute.

The Japanese industry has enjoyed constant aid and direction from the government, which has enabled it to respond quickly to the new conditions of the silk manufacturing industry in this country. The Chinese lack leadership. They are willing to change their methods, as willing as the Japanese, but control and guidance can be expected only from direct action on the part of the American manufacturer. The exchange of views facilitated by the visits of the American Silk Mission in 1920 and the Chinese delegation to New York in 1921 has awakened an appreciation of the situation. Already the Sericulture Hall at the Canton Christian College, made possible largely through contributions from the American Silk Association, has convinced our silk interests of the value of efforts in this direction. A similar department has been established at the University of Nanking to reach silk producers further north. A commercial testing house has been opened at Shanghai, which should become an important factor in improving standards of quality and in educational influence, if American buyers will make a practice of insisting that their purchases of Chinese silk shall be tested before shipment.

At this moment, when China appears to have turned the corner and to be on the road to recovering her supremacy in the world's silk market, the invention and recent rapid development of the manufacture of "artificial" silk in the United States is of utmost interest. Our domestic production in 1913 was 1.56 million pounds; in eight years it increased nearly tenfold; in 1922 it reached 24.4 million pounds; and production for 1923, it is estimated, will reach 33 million. At this rate, it will not be long before production of artificial silk will overtake and pass our imports of natural silk.

Artificial silk is a synthetic fiber made of sulphite wood pulp treated with chemicals and reduced to a solution. This is forced through minute holes, sized according to the fineness of the thread desired, into a "setting bath" which precipitates the solution and leaves the thread ready for the finishing processes of washing, drying, cleansing, twisting, reeling, etc. Filaments of artificial silk can be made of indefinite length — thousands of yards — or short staple fibers may be given the character of cotton or wool. They may be made rough and dull or smooth and lustrous. They may be made coarse like horsehair or in strands rivaling natural silk.

In the United States, artificial silk was first used in the knitting trades, for hosiery, sweaters, scarfs, neckties, underwear. Some of these articles consist entirely of artificial silk, and others of a mixture of the new fiber and natural silk or cotton. Manufacturers of narrow fabrics, braids, tapes, etc., are large consumers. The weaving industry has begun to use it, producing ever new varieties and combinations (as, for instance, men's cotton shirtings with a silk stripe in the pattern). Pile fabric manufacturers can make imitation furs scarcely to be distinguished from real. The millinery trade uses short-pile fabrics for artificial flowers, etc. Lace manufacturers are using it with effect in laces for overdraping, and ribbon manufacturers are experimenting with it.

What the future of this new fiber may be we cannot predict. The manufacturers, from the original inventor, Count Hilaire de Chardonnet (1884), claim for it an entirely independent position, not that of a mere substitute. It will never replace the natural fibers, silk, cotton, wool, etc., but on the contrary, it has enabled users of these fibers to produce articles which could not formerly be made. Purchasers unable to afford articles of natural silk can satisfy their taste with artificial silk goods. When it is used in combination with cotton or wool, it stimulates the demand for these textiles. Certain it is that during the past decade, while the output of artificial silk has been increasing at a rate beyond all precedent, our increasing consumption of natural silk has suffered no apparent decline (except, of course, the collapse of 1920, due to entirely different causes).

With such assurance from the trade itself concerning artificial silk, and with prospects of an improvement in quality of the Chinese natural product, we may assume with some degree of confidence that silk, supported of course by minor commodities such as tin, may be made a basis of exchange with the United States. China, in short, may have the purchasing power to make her an effective market for American manufactures. Supplementing the direct trade, China may pay for her imports of American machinery and interest on American loans indirectly. As her industries develop, she may supply East Indian markets with her own manufactures — she has the advantages of proximity and similarity of taste — the credit of her sales being applied for American purchases of East Indian products of rubber, hemp, etc.

Possibilities and Probabilities

We may therefore indorse the assertion that China is potentially the greatest market in the world, and add, also, for American manufactures. Her capacity to absorb our products is virtually limited only by our demand for her products. Some conception of the extent of this potential market may be gained by reference to our trade with Japan. In 1853, when Commodore Perry presented to Japan our request for the privilege of trade, a sugared ultimatum, the majority of the councilors voted to refuse compliance. Fortunately for Japan, they were overruled by their Emperor. Starting with the same deep-rooted aversion for Western ideas and customs, in less than fifty years Japan was able to defeat Russia, and is today recognized as one of the great nations of the world. She stands fifth among the countries with which we trade and fifth among foreign markets for our manufactures, chiefly machinery of various kinds. Japan is small and poorly endowed with natural resources. China is as richly endowed as the United States, more richly in agricultural resources, and has three times the population. To develop her resources she needs roads and railways and telegraphs. If the prediction of one engineer is accepted, she should have fifty thousand miles of railway within the next twenty years. Her cotton textile manufactures have already attained notable importance with nearly two million spindles and 7000 machine looms (compare Japan, almost four million spindles and 35,000 looms), and are said to pay dividends of twenty to thirty per cent for ten years at a stretch. What possibilities for future development!

"Possibilities," yes, but what are the probabilities? Her effective demand both for consumers' and producers' goods depends not merely upon the possession of resources, but upon the extent to which she actually develops them. What are the prospects of actual development? Japan has had the advantages of her handicaps. Her small size has facilitated the rapidity of her progress. Her government was able to exercise close supervision over the activities of the country, to direct and to assist where necessary. Indeed it has been to the wise direction of her autocratic government that her remarkable achievement has been chiefly due.

China's very size is her disadvantage, making it difficult to maintain a powerful central administration. During centuries of peaceful security, her loose-knit form of government, built upon the family with the authority of the patriarch as the source of control, was sufficient. Local affairs proceeded by their own momentum. Governments were effective only as they adapted themselves to the age-old habits and customs of the people. When the irruption of Western ideas upset the original order of things, however, central control and direction became necessary, but the inaccessibility of the remote provinces, and lack of adequate facilities for transportation and communication were practically insuperable obstacles. Before proper government control can be exercised, distance must be overcome. China must reduce her disadvantage of size.

There is another obstacle to China's progress, however, far more difficult to cope with than size or inadequate communications, a difficulty deep rooted in Chinese character. This is the pernicious practice of "squeeze." Squeeze has been described as a glorified tipping system, graft become ingrained in daily life. From the servant who regularly and as matter of course deducts for himself a fifth or more of the money you have given him to buy your provisions, to the government official who appropriates a share of the revenue collected from his administrative area, or purloins a part of the money received from abroad as a government loan, the practice is universal from lowest to highest.

The evil is by no means confined to China. It is as widespread as humanity. We cannot presume to sit in judgment upon China so long as many of our own government officials are busily engaged in the same enterprise, while the "spoils system" still remains, while powerful labor unions squeeze concession after concession from their fellow citizens who are occupied in less strategic positions, and financiers still try to get a "rake off" by "cornering the market." In China such practices are at least more justifiable than in a country like the United States. There, where the danger of starvation, the certainty of poverty for some members of one's family, always confronts one, the incentive to grasp at any and every advantage that may offer some economic gain must be infinitely stronger than in a young country which offers a livelihood for any one who is willing to work.

But whatever the moral aspects of the question, the economic evils are patent. The construction of railways in China, so essential for her development politically and economically, has been hindered and delayed at every step by obstacles, many of them intentionally placed, requiring payment of special rewards, commissions, fees, taxes, for their removal. The local magistrate must have his pockets liberally lined before he will fulfill his proper functions and prevent thieving of company property. Nepotism is another aspect of "squeeze." "The manager of a government plant, on looking into one of the departments which was going badly, found that thirty-three out of fifty-five men in that department were relatives of the foreman." When the Peking-Hankow Railway came under Chinese management, the positions along the line were filled upon the basis of sheer favoritism, with the natural result of loading the payroll with incompetents. The history of China's loans has been a repetition of the same tale. Officials in positions of trust have enriched themselves, and little of the original money has reached the object of the loan. Moreover, the loans have usually been obtained in the first place in return for concessions, the barter of territory and of sovereign rights by local officials upon their own responsibility and for their pecuniary advantage.

China, with her "leased territory," her foreign municipal settlements and "spheres of interest," the exercise by foreign nations of the principal of "extraterritoriality" (whereby the foreigner is not subject to laws of the country in which he is living but to those of his homeland), the foreign postal systems and wireless stations established upon her land, foreign troops quartered in her cities, foreign control of her tariff system and taxes—moves us to deepest pity; a country that has lost its own identity. When we realize, however, that a large part of this has resulted from the rapacity of her own officials, our sentiments cannot but suffer some modification.

Efforts toward government reorganization can accomplish nothing, for whatever the form of government, the practice of "squeeze" persists. The Imperial decrees and mandates against the opium traffic carried on by the British simply gave the local mandarins and their subordinates a new pretext for extorting commissions from the merchants to permit smuggling. No diminution of the practice came with the change to the republican form of government. The provincial governors are even stronger, less restrained, than their predecessors under the Empire, the notorious mandarins. They maintain their own armies, extort taxes for their personal enrichment, and spend much of their time in fighting and looting the neighboring provinces. Today, the struggle between North China and the South or Young China, is little more than an effort of the Outs to get in. Behind their lofty phrases, the student idealists generally are said to be as lacking in true patriotism, public spirit, and administrative honesty as their colleagues in the North.

The only possible cure for China's ill is the rigid enforcement from top to bottom, of *audit control*. How to apply the remedy is the problem. Can she enforce it from above? This implies a strong central government already established. Can she change her own character — the character of her officials, if not of her three hundred millions? Possibly, but how slow! The modern world cannot wait for Eastern rates of progress. The control, in short, must be imposed from without. The question is, by WHOM?

CHAPTER XII

JAPAN AND THE EASTERN QUESTION

Japan resembles Great Britain. Although she is still an agricultural country, she is dependent, like Great Britain, for her raw materials. This is due, however, not to the greatness of her industrial development, but to meagerness of her resources. She owes her rise to her autocratic government. To continue her development, she must obtain a source of materials, or ultimately suffer eclipse by China. Japan's policy of territorial acquisition is thus not merely for space to accommodate her population, but for self-preservation — and future supremacy. Thwarted by Western interests and American policy, she must resort to methods of indirection, but her objective is manifest. For the maintenance of her rights, China can expect little from Japan, from her own patriots, or from the protection of Europe. Interference by the United States must sooner or later precipitate us in a war with Japan, waged at our great disadvantage. The alternative, to desert China, is a reversal of our policy and leads ultimately to the "Yellow Peril."

The Britain of the Orient

JAPAN has been called "the Britain of the Orient." The points of striking resemblance between Japan and Great Britain have often been remarked. She is an island nation, and comparable in size — in area a quarter larger, in population a third. Not counting her acquisitions (which have no representation in her parliament), her area is 149,000 square miles, her population 56 millions. The total extent of the Empire, including Formosa (Taiwan), Korea (Chosen), Sakhalien, and several smaller island groups, amounts to 261,000 square miles, population 77 millions. Japan herself comprises some six hundred islands of appreciable size. The largest or so called "mainland," Honshiu, is 85,000 square miles or about the size of England, Scotland, and

Wales. Hokkaido, north of Honshiu and next in area, is 30,000 square miles, corresponding to Ireland. Compared with the British Isles, however, Japan is less compact.

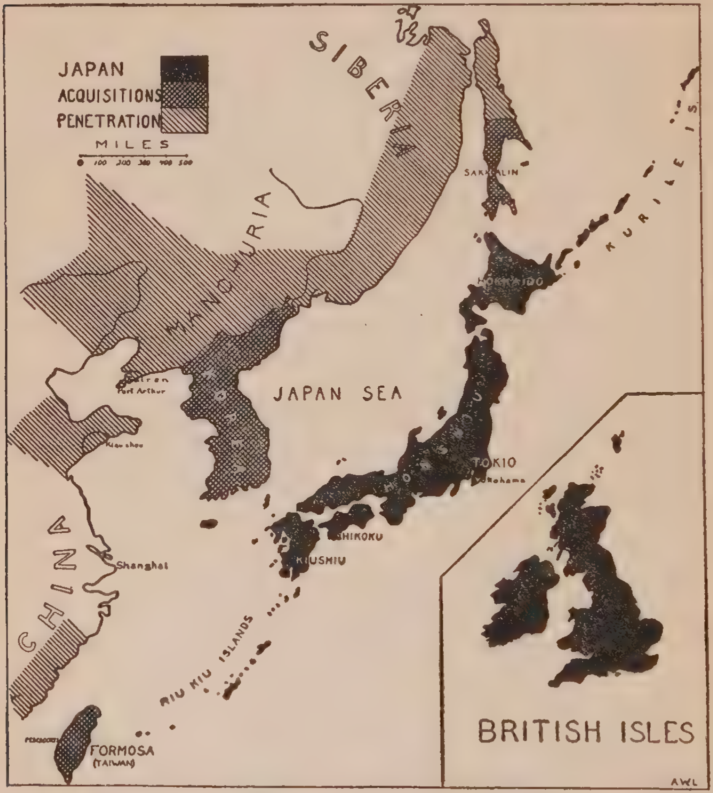

FIG. 56. The Japanese Empire, Acquisitions, and Economic Penetration in China and Siberia.
(With inset of the British Isles for comparison of size.)

Honshiu itself is shaped like a bow 800 miles long and less than 200 wide near the middle. From the southern point of Formosa to the northernmost island of the Kurile Archipelago is about 1750 miles.

The topography of Japan is far more rugged than that of Great Britain. Lofty mountains, some of them 12 to 14,000 feet in height, and many of them active volcanoes, occupy the greater part of the islands, leaving a narrow strip, rarely more than ten miles wide, along the seacoast. Difficulties of railway construction are obviously most serious, the more so that earthquakes constantly destroy what has been built. Owing to the topography, the railways must be laid along the river valleys, and during the rainy season destructive floods carry away bridges and do much damage. When water transportation is possible, the roads must face competition with the cheaper carrier. Thus the total length of Japan's railways is only about 8500 miles, or, in proportion to her size, a quarter the length of those in the United Kingdom. Good roads scarcely exist.

The straits between the islands and the continent, like the Straits of Dover, have served Japan as a protection against invasion. At some very early date, prehistoric, Mongolians landed from the north, and Malayans, coming from the south, drove the aborigines to the island of Hokkaido or Yezo, where their descendants still live. Kublai Khan tried to invade Japan in 1280, as we read in Marco Polo's narrative and in the Japanese and the Chinese accounts, but his expedition failed.

While protected against attack, Japan, like Great Britain, owed her civilization and culture to the continent. Since the Chinese under Wu-Ti conquered Korea (140 to 86 B.C.), the Wa or dwarfs, as the Japanese were called, are known to have maintained communication with Korean authorities, and they doubtless received Chinese ideas. In the fourth or fifth century A.D., Confucianism was introduced into Japan. In the seventh century, the Japanese government was organized upon Chinese lines. The seventeen articles of Shotoku-Taishi's constitution bear traces of Chinese and Buddhistic influence. Chinese characters were used to express the sounds of the Japanese language. The Chinese calendar was adopted. Although Japanese culture is very distinct from Chinese, just as British culture is different from Italian or French, the debt of each island people to the neighboring continent is unmistakable.

Japan's insular position has encouraged fishing as a livelihood, and an aptitude for the sailor's life. Her modern merchant marine, started in 1874, now stands third in the world:

Comparison of Japan's Merchant Marine

(Excluding sailing vessels)

	Number of Ships	Gross Tonnage	Average Size
Japan	2,033	3.36 million	1,650
United Kingdom	10,324	21.59 million	2,100
United States	4,343	15.75 million	3,630
France	1,662	3.30 million	1,985

In addition she has a fleet of 14,415 sailing ships of European model amounting to almost a million tons, besides her junks, which are found serviceable as cargo and fishing vessels and are still built along the lines that have persisted for centuries. Her navy, too, is the third greatest in the world — second in proportion to her size and probably the largest in relation to the navy's task of defense.

Economic Development and Resources

In contrast with Great Britain, Japan is still essentially an agricultural country. Sixty per cent of her population are farmers, compared with only ten per cent in Great Britain. Although the average population density of both countries is almost the same (380 persons per square mile), and the area of arable land in Japan is only 15 million acres to Great

Britain's 20 million, Japan is nevertheless practically independent for her foodstuffs. She exports almost as much as she imports, and her major export, silk, is an agricultural product.

The farms, indeed, are really truck gardens. Ninety per cent of them are under 5 acres; over a third, under 1¼ acres; as many between 1¼ and 2½; and the balance 2½ to 5. In Great Britain more than half the farms are between 5 and 50 acres, and 25% between 50 and 300. The average yield per acre in Japan is naturally high, although lower than in the industrial countries of Europe with their more advanced methods of intensive agriculture. Her wheat yield is 22 bushels per acre, as compared with 31 in Great Britain and 13 in the United States. Her rice yield, 73 bushels, may be compared to that of Hawaii, 113, Italy 78, India, 30. Her barley yield is about the same as Great Britain's, 32 bushels per acre.

On the other hand, most striking is the similarity in the trend of Japan's economic development to that of Great Britain: toward trade and finishing industries, importing raw materials and exporting manufactures. Almost half her imports today consist of raw materials, and twenty per cent more are in the form of partly prepared materials, such as bar and sheet iron. Of her exports, forty to fifty per cent are manufactures.

The rapidity of her industrial development gives promise for the future. In fifteen years the number of her workmen has doubled, her factories increased two and a half times. (In the same time in the United States, the number of employees increased by only 75%.)

The earliest modern industry to be established in Japan (1862) was the cotton textile industry. It has achieved the greatest development. In 1919 it produced goods worth $500 million, or 50% more than her silk textiles. (Compare the United States, cotton fabrics $2125 million and silk goods $688 million.) Twenty-five per cent of her total exports consist of cotton yarn and fabrics. In 1920, there were reported 3.93 million spindles in active operation, and owing to her concentration upon the production of coarse goods, Japan uses nearly two million bales of cotton per annum (1919/21), two thirds the consumption of Great Britain for the same period (2.8 million bales), and 40% of her pre-war figure (4.4 million). For this great industry she is entirely dependent upon imports for her raw materials. Two thirds of her cotton came from India (670,000 bales), and she stands second to Great Britain as a market for American cotton — ahead of either Germany or France — taking about a third as much as England or an eighth of our total exports. Cotton forms (1919/21) 38% of our total exports to Japan.

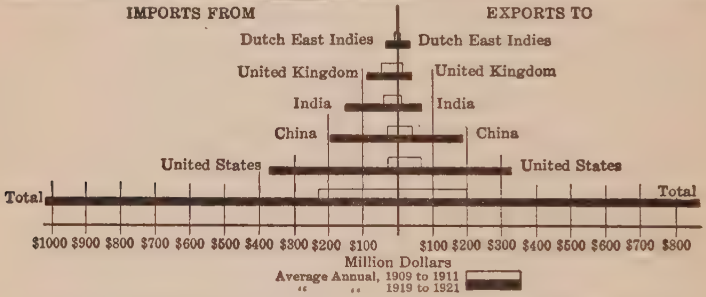

FIG. 57. Foreign Trade of Japan, Annual Average, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

Silk textiles stand second among her industries, with an output valued at about $335 million in 1919. For this industry, she is of course independent. For her wool textiles, however (output $62 million), she must purchase wool; for her leather industries, hides and skins; flax for her linens; and rubber.

Japan's mechanical industries are growing. Machinery, to be sure, is the chief item of her imports of manufactures —

$50 million per annum during 1919/21, or 5% of her total imports (two thirds from the United States). But she already manufactures locomotives, certain kinds of textile machinery, electric dynamos, lathes, etc., some of which, to the value of about $6 to $8 million, even find sale in foreign markets. In shipbuilding also Japan has demonstrated ability. During the years 1918 to 1920, 655 ships were launched, aggregating 1.69 million gross tons. The Kawasaki Dockyard at Kobe claims the world's record for speed by building a vessel, the *Raifuku Maru*, 9000 tons dead weight, length 385 feet, in twenty-three days. The keel was laid on October 7, 1918, and the ship launched on October 30.

But Japan's dependence upon foreign countries for her raw materials is due, not to the extensive development of her manufactures, but rather to her poverty of natural resources. Her industries in general are still carried on in the cottage. We must be careful not to get an exaggerated idea of her industrial development. Very few of her industries show a production in excess of 5% of the corresponding American industry. The total number of factory workers in her 23,831 establishments (of over ten persons) is 1.39 million (1920). Her mines employ 465,000. These figures, however, owing to the low output per employee, give the appearance of a greater industrial development than she has actually attained. Fifty-five per cent of the factory workers are females (compared with fifteen per cent in the United States).

Unlike the England of a century ago, Japan is poor in mineral resources. Her coal reserves are estimated at 8 billion tons — Great Britain has still 190 billion. Furthermore, Japanese coal is of inferior quality, much of it so friable that it is practically dust or low-grade screenings when it reaches the customer. The amount suitable for coking for use in blast furnaces is very small. The price runs about four times as high as American coal of the same grade.

Three quarters of the coal reserves are located on the island of Kiushiu, at some distance from the industrial centers.

This deficiency in fuel may be offset to some extent by hydroelectric development. Japan has an average rainfall of 62 inches, in some places double that. Her short but rapid streams offer a potential development of 4 million h.p. at low water (8 million at mean). This is seven times that of Great Britain and only slightly less than that of France. There is no great concentration — the largest streams drain areas of only six to eight thousand square miles — but half of the water power is situated in Honshiu along the western watershed, and within easy power transmission to Tokyo and Yokohama. Already over a million horse power has been developed, and projects are on foot to link up the small units into a single "superpower" distributing system. However, if fully utilized, the power obtained would be equivalent to only 22 million tons of coal, or less than the present annual consumption for her industries, railways, and shipping.

Japan's iron ores are widely scattered. The reserve tonnage of the best known deposits is about 20 million tons. Other deposits raise the total to perhaps 60 million. This may be compared with Great Britain's 450 million available ores plus "thousands of millions of tons of poorer ores." Japan's pig iron production probably reached 375,000 tons in 1920 (1% of the United States' output during the same year); her steel amounted to 81.5 million kwan, or 300,000 tons. She can import, however, more cheaply than she can produce. Her average annual purchase in 1919 to 1921 was about 1.7 million tons.

As a copper producer, Japan stands at present second to the United States — 7.9% of the world's total production — but it has been estimated that her future relative importance is only about 2.2% among the countries of the world. She will have scarcely enough for her domestic requirements.

Japan, then, is *beginning* her industrial development at a point reached by Great Britain only after she had passed her zenith. England developed her industries upon the sound basis of a plentiful supply of coal and iron, and although obliged to import cotton, the source of supply was free from competition and bound by ties of economic interest and blood relationship. The factors of production were capable of indefinite expansion. Japan is entering the industrial field deficient in fuel and mineral resources and facing the growing competition of other countries for supplies of cotton, wool, etc. That any nation, indeed, with so few advantages could achieve the position that Japan has reached is indeed astounding. She had no background of industrial experience, no skilled labor supply or trained organizing ability, inferior fuel, and was dependent for well-nigh every raw material. She has owed her remarkable rise entirely to the energetic administration of her powerful autocratic government.

Industrial Progress under Autocracy

In further contrast to Great Britain, Japan, patterned upon the late German Empire, is the most perfect example of a highly centralized military autocracy. The pupil has far outdistanced the master. The Emperor (nominally) and his advisers, the Genro, a small group of half a dozen elder statesmen, determine Japan's policies, internal and external. All executive power is vested in the Emperor, power to declare war and peace, arrange treaties, etc. The legislative function belongs to the Diet, the upper house or House of Peers, but the Emperor's sanction is necessary for all laws; he may open or close the Diet at will; he may dissolve the house of representatives, which indeed has little authority even in matters of finance.

National policy can thus be farsighted, consistent, subtle. It is not the sport of changing political parties; it is never open to the annoyance and publicity of interpellation by a critical minority. Great Britain's industrial revolution was a natural development, speedy in comparison with earlier progress, but ever hampered by mistakes and changes in policy, waste of energy, conflict of interests, etc. Japan's industrial development has been the steady course of a ship steered by a master pilot, who is able to avoid rocks and shoals already charted for him by the experience and hardships of others that have traveled the way before.

At first hostile to Western ideas, the Japanese government gradually changed its attitude (about 1868). European languages began to be taught in the schools, and Japanese students were sent to Europe and America. In 1899, foreigners were freely allowed to reside and to establish industries anywhere in Japan — a privilege, be it noted, subsequently withdrawn. Industry, agriculture, mining, education, finance, railway construction, military science, all received careful attention and constant encouragement. Nor has the government confined itself to encouragement only, but has actually entered into business enterprise as a corporation. New methods or devices have been tested first by practical application before being passed on to private companies. Direct assistance is given to industry in the form of subsidies, tariff protection, special inducements for combinations or coöperative enterprises for purchasing materials or marketing products. The government is associated with the large banks, and through these banks finances special undertakings by granting rates of interest below the market and making up the deficiency to the bank from tax revenues. By its monopoly of certain industries, the government has been able to prevent abuses. The camphor trees, for instance, have been saved from the wholesale destruction that in China practically annihilated the industry. By monopoly of the opium traffic it has been possible to prevent the drug from becoming, as in China, a menace to the health and prosperity of the nation. Industry and commerce have gone hand in hand with foreign diplomacy, close partners in the great game of national progress.

In short, Japan's industrial development, in direct contrast to that of Great Britain, has been imposed from above, a purely artificial structure, rather than an outgrowth from abundant natural resources. Thus far she has been able to make a beginning in industrial development through government intervention. But how far can this be carried? Subsidies have to be drawn from the people in taxes, impoverishing the many for the benefit of the few. This procedure tends to obscure relative values by exaggerating the apparent gains — the ships and factories built — and minimizing the loss, the burden of taxation and lowered standard of living — less tangible, but just as real. There is the danger that government interference with the natural course of economic law may overreach itself.

Territorial Expansion or National Eclipse?

Japan is in a condition of unstable equilibrium. She is embarking upon a course of large-scale, capitalistic production, manufacturing the cheap, coarse goods required by the Oriental market and best suited for her unskilled labor to produce, but with a relatively heavy consumption of raw materials. But she is almost completely dependent upon foreign sources of supply for these materials. Her factors of production are not readily increasable. She must either see her industries decline in the face of competition of countries more amply endowed with natural resources, perhaps China and India, or acquire an adequate and certain source of raw materials of her own.

Across a narrow strip of water lies a great country possessing coal, iron, and other metals, with vast potential agricultural resources, with all that Japan needs — but lying idle. China, like Mexico, sits a beggar on a bag of gold, without the ability to use her wealth herself. From the point of view of the total sum of economic prosperity of the world (an argument heard frequently today in connection with the European settlement), it is Japan's province to develop these idle resources. What other country is better fitted to straighten out China's tangled domestic affairs, to introduce that audit control to which we have referred: to establish for China that strong centralized government, without which her progress will be impossible? Japan is close by, she has the military strength and the energy, she has an understanding, herself an Oriental, of the Eastern mind and traditions. She is the natural complement of China.

For Japan, the matter is vital. The moment that China awakes, Japan will lose her leadership in the Orient and become little more than a Cuba to China. Writers who see in Japan's attitude toward China simply another manifestation of arrogance and land greed of military power have failed to analyze the situation. For Japan to content herself, as they would urge, with "economic penetration," to rely for her material supplies simply upon financial control over the sources, would be suicidal. The mines she dug, the factories she established, the railroads she built, would all be hastening the day when China could take them over and operate them for herself. The United States may invest capital and enterprise in Cuba without fear of future competition, but if the relations were reversed, Cuba would promote America's economic development with the certainty of her own ultimate eclipse.

Japan's position may be contrasted with that of Great Britain, whose policy has been only to intervene in continental affairs in order to prevent any one nation from attaining too great an ascendancy. It may be contrasted with that of the United States: our policy of the Monroe Doctrine guarantees the continued independence of countries in the western hemisphere, without implication of aggression on our part or any restriction upon the development of their resources by foreign assistance. Our own resources are ample to meet our requirements.

The argument that Japan must acquire new land to accommodate her growing population is sheer propaganda. We are inclined to give it too ready credence, because, with our sparsely settled country, we can scarcely conceive of people being able to maintain existence under conditions of such congestion. But population growth is not like the rising tide, steady, irresistible. It is determined by a number of variable factors, economic, psychological, and physical. Severity of living conditions checks it, improved conditions stimulate it. Germany's rapid growth was directly due to her increasing economic prosperity. To say that more space is needed because the population is increasing is to put the cart before the horse: the population *is* increasing because the room is sufficient to support the increase.

If Japan's aim were really to relieve congestion at home (though it is said that with modern scientific methods and tools her agricultural resources would be capable of supporting 35 millions more still upon the four large islands alone), it is not at all certain that she could gain much by seizing Chinese territory. Already she has discovered in Korea that her people cannot compete with the natives, and are being crowded out by the Chinese immigrants. But this fact is no proof that Japan's policy of territorial expansion as such is faulty, that she must soon awake to her mistake and abandon her aim. On the contrary, a large serf population is exactly what Japan wants, for what she really needs in her new territory is the resources, not the space. The larger the laboring population to exploit these resources, and the less she must pay to win the coal and iron from the earth, to raise the cotton, silk, and wool for her textile factories, so much the better. For over two and a half centuries, the Manchus ruled China. In 1911, when their dynasty fell, they were five million strong and, holding all administrative offices, formed an exclusive aristocracy supported by the three or four hundred million toiling Chinese subjects. To duplicate this, as the ruling and organizing genius of China — nothing could suit Japan better!

China, organized and controlled by a powerful centralized Japanese autocracy! — an Empire of 400 millions, greater than the British Empire, but unlike the British Empire, a compact unit. As a labor supply, a vast reservoir, independent of immediate industrial employment but capable of being drawn upon indefinitely as required; with enormous coal deposits and reserves of iron and other minerals, the bases of capitalistic production; a domestic market limited only by its purchasing power, and with extensive foreign markets close at hand: *all factors indefinitely increasable* — this is Japan's prize; her alternative, submergence.

Western Intervention

Standing between her and her objective are the interests of the Western nations. Long before any one had dreamed of Japan becoming a world power, Western interest had been active in China. Her tea and silk were choice articles of trade. Unfortunately there was very little that the Chinese cared to purchase from the West. The British were able to meet the difficulty by smuggling opium. Opium had been brought to China as early as the 9th century by Arab traders, and in the 12th century was imported by the Chinese themselves from India. At this time it was used only as a medicine. In the latter half of the 18th century, the Portuguese had developed a thriving trade, and later the British East India Company enjoyed a monopoly of the Indian opium traffic (taken over by the British government in 1793). The drug became a distinct menace in China and the Imperial Government prohibited its import in 1796. With the connivance of the local Chinese officials, however, the smuggling of opium steadily increased. Finally (March,

1839) the government, forbidding all foreigners to leave Canton, seized the contraband drug, some of it still on board British ships, and destroyed it. This act, and further demands the next year, as well as the arrogance of the Chinese officials, their unreasonable exactions, and the indignities they visited upon the Europeans, led to a war with Great Britain. By the subsequent treaty of Nanking in 1842, China ceded Hongkong to Great Britain, opened five ports for foreign trade, and paid an indemnity of $21,000,000.

This was the beginning. Other territorial concessions followed:

1858	The Maritime Province east of the Usuri River to Russia
1860	Kowloon ceded to Great Britain
1864	Cochin-China to France
1871	Ili territory to Russia
1874	Riu-Kiu Islands ceded to Japan
1885	Tongkin and Annam ceded to France
1886	Port Hamilton, Korea, ceded to Russia
1887	Macao ceded to Portugal
1890	Sikkim to Great Britain
1895	Korea, Formosa, and the Pescadores ceded to Japan
1898	Kiauchow leased to Germany
1898	Port Arthur and Dairen (Liaotung Peninsula) leased to Russia
1898	Kwangchouwan in Kwantung leased to France
1898	Weihaiwei leased to Great Britain

Accompanying the territorial grab, there was a general scramble for special trade concessions and establishment of "spheres of influence," and the extension of foreign control through financial loans.

The United States alone failed to join in the process of partition. Although we had entered into commercial relations with China as early as 1784, our attention was taken up with the development of our own resources. Whether, if our interests had been as great as those of the other countries, we might have assumed a different attitude one cannot say. Throughout all China's troubles, however, we have consistently opposed (as at the time of the Boxer rebellion) proposals further threatening China's integrity and sovereignty. Left thus without our own slice of China, and realizing at last the future possibilities of the country as a market, it was perhaps natural (as well as creditable), that we should advocate the principle of the Open Door, the doctrine first formulated in 1899 by John Hay, United States Secretary of State. While admitting spheres of influence and recognizing vested interests, we insisted upon equal opportunities of trade, equal treatment for foreign merchants and shipping within these spheres. The doctrine of the Open Door, and the further principle of the integrity of China, was accepted by the European nations, save Russia, and has received lip-service from Japan. The economic interests of Europe are satisfied with what they have already obtained. With the recognition of their spheres of influence, their trade is benefited rather than injured by the Open Door. Our own opportunity is distinctly improved. Japan alone finds her ambitions thwarted.

Japanese Strategy

The Japanese may or may not be a race slippery and cunning by nature. Our concern is simply to understand their position in order to know what to expect from them in the future. A nation proud, and very properly so, of her achievement and of her present standing in the world, but dependent for her future development upon the acquisition of near-by resources, she is blocked only by the injunction of the Western powers. Each day's delay, which gives China an opportunity under Western tutelage to establish herself, makes Japan's prospects the more dubious. A devious course and the use of smoke screens are her only hope of ultimate success. What alternative has she?

Directed at first largely by circumstance, Japan has become ever more confirmed in her adopted policy, as she has realized her own strength, possibilities, and needs. Her tactics of the past few years are sufficient to declare her objective.

Korea, annexed to China in 108 B.C., had for many centuries been a vassal — content to remain so, for China's suzerainty was little more than nominal. In 1876, however, Japan deliberately ignored the suzerainty of China and in a special treaty recognized Korea as an independent sovereignty. Eight years later, upon occasion of a riot, China sent troops to protect the Imperial Palace, but found it already occupied by Japanese soldiers! An agreement was reached that each party should recognize the independence of Korea, and should notify the other in case of sending troops into the country. Another uprising in Korea brought a Chinese detachment to the scene. Japan was duly notified. Charging China with breach of faith for not giving notice before the dispatch of her soldiers, however, Japan declared war, and China, as a result of this war, was compelled definitely to recognize the independence of Korea.

The threat of Russia's occupation of Korea precipitated the Russo-Japanese War of 1904–05, at the conclusion of which Japan, obtaining at last recognition of her preponderating interest, acquired suzerainty over Korea. With a free hand in Korea, Japan was soon able to transfer (1907) the administrative authority to Tokyo. In 1910, despite her repeated assurances that the sovereignty and integrity of Korea should be respected, she formally annexed it, on the ground that the Korean government had shown itself ineffective in preservation of peace and stability. As a weak friend, Korea might be a danger to Japan on account of Chinese and Russian designs; as a possession, she would be at once a strong buffer, and a valuable foothold for further territorial acquisition.

Japan's designs upon the Liaotung Peninsula, or Kwantung Province, date back to 1895. The almost impregnable Port Arthur, and Dairen, give access to Manchuria, and a point of vantage for attack on China. At the conclusion of the Chino-Japanese War the cession of this strategical territory was one of the provisions of the treaty. The Powers of Europe, however, Russia, Germany, and France, who had their own special designs upon China, compelled Japan to relinquish her spoils, and Russia soon after obtained a lease over the same land, to expire in 1925. By her victorious treaty with Russia in 1905, Japan fell heir to Russia's leasehold, and in 1915, when the attention of the world was absorbed in the War in Europe, she found her opportunity to force China to extend the lease for a period of ninety-nine years.

At the time of the Russo-Japanese War, the Japanese press (which, by the way, is under strict government censorship) strongly urged the seizure of Manchuria and Mongolia — territory belonging, not to Russia, but to China, a neutral — and the occupation of Siberia east of Lake Baikal. Among her list of twenty-one demands presented as an ultimatum to China in 1915, Japan insisted that Japanese subjects might acquire land, mines, etc., and enjoy full liberty to travel and carry on business anywhere in South Manchuria and Eastern Inner Mongolia; that Japan's consent must be obtained in advance for any railway construction to be undertaken by other nationals or for any loans secured by taxes; and that whenever the Chinese government might need advice on political, financial, or military matters, Japanese instructors should be first consulted. Incidentally, the lease of the Kirin-Changchun Railway was acquired for a term of ninety-nine years.

In 1918, Japan was able to extend military control in Manchuria. By secret agreement — of course everything must be done secretly — she obtained China's authorization to "coöperate" for the defense of the northern frontier, and to exchange military experts, military maps, passwords, etc. The Japanese police force was soon increased to 3000 in the Chientao district on the pretext of protecting some 700 Japanese immigrants (most of them, indeed, Koreans). Many of the railway employees are said to be Japanese military officers, and the towns and villages have their resident Japanese officers and soldiers. Manchuria has become virtually a Japanese protectorate.

Her strategy in Siberia was aided by the alleged menace of Bolshevism. To her magnanimous offer to send Japanese troops to Siberia — tendered with the express stipulation that she had no desire for territorial annexation or permanent occupation — the Allies responded by providing a joint expedition, each power to contribute 7500 soldiers. However, the occasion served. In six months Japan had over 70,000 men in Siberia. Upon Secretary Lansing's strong protest, 52,000 were returned to Japan, but next year again her troops numbered 60,000. We cannot here repeat the story of her maneuvers to force the withdrawal of American troops, and efforts to stir up ill feeling against the Americans, her arming of the Kappelite clique in order to overthrow the Vladivostok government and establish in its place suitable pro-Japanese puppets, her secret terms with the Far Eastern Republic, whereby, in addition to concessions regarding fisheries, commerce, and mines, she was to obtain the annexation of the northern half of Sakhalien. At the cost of some money and a flagrant disregard of her pledged word, Japan has eventually secured a foothold in Siberia.

Shantung has afforded another focal point of Japanese intrigue. Kiauchow, in the Province of Shantung, is a position of very great strategic importance, second only to Weihaiwei (leased by Great Britain, but to be restored now to China) as controlling from the south the entrance to the Gulf of Chihli and North China. It has an excellent natural harbor, and is within economic distance of China's enormous coal fields and iron deposits. Within the zone of the Kiauchow-Tsinan Railway are situated two coal fields and an iron mine with 40 million tons of high-grade ore; on the projected southern extension of the railroad, three bituminous coal fields with total reserve of over a billion tons; and its westward extension would reach the province of Shansi, with further reserves of coal.

Kiauchow had been leased by Germany in 1898, for a period of ninety-nine years. In 1863, a Prussian expedition, sent to the Far East to seek a suitable naval base for Germany, reported after a thorough investigation that the harbor of Kiauchow was by far the most desirable spot. Many years elapsed before Germany was fortunate enough to find a pretext to make good her choice; but the murder of two German missionaries in 1897 afforded the necessary occasion. An expeditionary force promptly occupied the territory and obtained the lease.

One of the provisions of Japan's notorious twenty-one demands was that the Chinese government should "give full assent to all matters that the Japanese government may hereafter agree with the German government respecting the disposition of all the rights, interests, and concessions which, in virtue of treaties or otherwise, Germany possesses, vis-à-vis China in relation to the province of Shantung." The true significance of this demand in relation to Japan's diplomatic scheme may be appreciated when it is pointed out that the acquisition of the German possessions in the Far East was undoubtedly the real purpose for which Japan entered the World War. She had no quarrel with Germany. On the contrary, she entertained a profound admiration for the country whose political structure she had adopted. Her alliance with Great Britain did not require her participation in the War. She admitted this herself, when she was not advertising the contrary for propaganda purposes. But if she had not joined the Allies, the German possessions would soon have fallen to Great Britain. To anticipate any such event, Japan lost no time in sending her ultimatum to Germany, and even before she had received a reply, had dispatched a naval force to seize the Pacific islands.

She also took Kiauchow and proceeded with utmost celerity to "dig in." By 1918, over 30,000 Japanese were in Shantung Province; they had obtained military possession of the entire railway, 300 miles, from Tsingtao, the port, to Tsinanfu; had taken possession of mines, erected radio stations, seized the public service enterprises of electric light, telephone, etc. — in fact, had assumed powers of control far in excess of those ever claimed or exercised by Germany and in total disregard of the rights of China. Although she had seized Kiauchow with the alleged purpose of "its eventual restoration," and in total disregard of the rights of China, it has only been after a bitter and persistent diplomatic struggle that Japan has at last been forced to relinquish her hold and to restore the district to China.

Finally, and most astounding of all her intrigues, was her direct attack upon China herself, those demands that aimed to reduce China to the position of a vassal and establish Japanese supremacy. Under Group V of the twenty-one demands, the Chinese Central Government was enjoined to "employ influential Japanese as advisers in political, financial, and military affairs"; that "the police departments of important places [in China] shall be jointly administered by Japanese and Chinese, or the police departments of these places shall employ numerous Japanese, so that they may at the same time help to plan for the improvement of the Chinese Police Service"; that "China shall purchase from Japan a fixed amount of munitions of war (say 50% or more) of what is needed by the Chinese Government or that there shall be established in China a Sino-Japanese jointly worked arsenal. Japanese technical experts are to be employed and Japanese materials purchased"; that "if China needs foreign capital to work mines, build railways and construct harbor-works (including dock yards) in the Province of Fukien, Japan shall be first consulted."

At the time of the Versailles conference, Japan exerted every effort to induce the Peking government to delegate her to represent China! Failing this, she intrigued to have China's peace delegation include a majority of Chinese who were subservient to Japan.

Meanwhile Japan has been busy with her economic infiltration. In return for loans, she acquires rights to exploit mines and timber resources. Technical validity of these deals is of secondary moment. The signatures of local governors or individual ministers are sufficient to afford the pretext she wants. She has succeeded in wringing from China special preference for her subjects to travel, reside, and do business anywhere in China. Thus while Europeans and Americans were confined to the treaty ports, Japan has been quietly extending her influence throughout the length and breadth of the country.

The progress that Japan has made by her steady and persistent, though crablike, method of procedure, is startling. From the map, we see that she has established a line of blockade from Fukien to the extreme north of Manchuria. Her foothold in Korea and southern Manchuria gives her an approach upon Peking by land — the original path of her attempted invasion of China in the 16th century. Her influence in Outer Mongolia and Siberia protects her from interference on the right flank. She is maneuvering, as we have seen, to establish a "sphere of interest" in Fukien "in view of the relations between the Province of Fukien and Formosa," and in case of war, one of her first moves would be the seizure of the ports of Fukien. This would give her a foothold to the south, the other jaw of the pincers. Economically, she already controls territory known to contain a great portion of China's mineral resources, and it will be but a short step to seize the valuable coal and iron of Chihli and Shansi.

China's Appeal

China asks recognition as a sovereign nation, and that her rights as such be respected. We cannot but sympathize with her desire. The treaty between the nine powers drawn up at the conclusion of the Washington Conference (1921–22) has gained for China something in this direction by the statement of principles and policies to be followed in matters concerning her. She obtained a revision of her tariff, and the return of certain leased territories; the publication of all treaties, agreements, contracts, etc., which are deemed to be in force between China and other countries or their nationals; the prospective abandonment by foreign powers of the principle of extraterritoriality, upon her adoption of legislative and judicial reforms. The powers have pledged themselves generally "to respect the sovereignty, the independence, and the territorial and administrative integrity of China," to observe her rights as a neutral in case of war; to relinquish claims to spheres of interest, which by their vague implications are provocative of controversy; to refrain from taking unfair advantage of conditions in China to seek special privileges; and to use their influence to maintain the principle of equal opportunity for commerce and industry.

But for the application of these principles, of course, much will depend upon the good faith of the signatories; the extent to which Great Britain and the United States will coöperate; the extent to which Japan may guide her future actions with strict regard for the spirit as well as the letter of her agreements; and especially the extent to which China herself will be able to make use of her opportunity to establish and maintain a strong central government and to create an efficiently operated public administrative service.

Great Britain and the United States may coöperate — though it must be noted that British interests relate to South China rather than to the region of Japanese penetration — but how likely is it that Japan will reverse her policies and "sincerely seek, or at least avoid the placing of obstacles in the way of the welfare of its great neighbor"? Will China, on her part, be able to find some patriot with firm hand, broad vision, and incorruptible moral fiber, who can so reorganize, unify, and strengthen his country from Peking to Canton as to command the confidence of the Western nations and to remove the menace of Japanese aggression? Without such a ruler, the longer she temporizes, the less likely will be her chance of retaining her integrity.

The prospect for China is not bright. Her only hope, so far as one can see today, is in the protection of Western nations. Rather than try to free herself from their tutelage, she should invite their more complete intervention, the power not merely to advise, but to enforce their recommendations. But Europe can do little for China. The continental nations are absorbed in their own difficulties. Great Britain, moreover, must avoid any open breach with Japan on account of India. Japan, under cover of the Anglo-Japanese Alliance, has been extending her influence as leader and protector of Asiatic peoples, and is in a position, in view of the unrest throughout India, seriously to embarrass Britain's Imperial administration. England may never forget how during the War Japan took advantage of her preoccupation to undermine British interests in China; how she launched a bitter press campaign against England, her ally, and in favor of Germany at the darkest period of the struggle; how she negotiated a secret treaty with Russia nullifying the Anglo-Japanese agreement, which still had half its time to run. Nevertheless, she is in no position now to incur Japan's hostility by fighting China's battle; and of this Japan is well aware.

The United States at the Cross Roads: Our Far Eastern Problem

If China is to be protected from Japanese rapacity, the burden of responsibility must rest upon the United States. This means that sooner or later we must come into open conflict with Japan. That little Japan, however, could ever dare to defy the United States would appear the remotest possibility! On our part, also, commercial interests would strongly oppose any interruption of friendly relations. Japan is our best customer in the Far East, buying our cotton and manufactures; we obtain from her five sixths of our silk, our second greatest import.

But Japan is not without points of advantage in a war with the United States, and her necessity is great. If we want to prevent her encroachments upon China, we cannot invite her to fight us upon our side of the Pacific; we must cross to meet her in her own position. From a defensive point of view, Japan is already almost strong enough to defy Western dictation. Her island empire by itself, it is true, affords an insufficient economic base for a great war — as was evident in 1905. A strict blockade would quickly reduce her to submission. Today, however, she has behind her the resources of Korea and Manchuria. With her powerful army, she can speedily seize northern and central China. Her influence is strong in Siberia, and Russia is impotent; she need fear no attack from the north. The deserts and mountains of the interior of China, and the poor roads and lack of railways make hostile approach from the south and west difficult or impossible. Her cordon of islands, properly fortified and mined, can be rendered well-nigh impregnable against attack by sea, converting the Yellow and Japan Seas into harbors for her fleets, from which they may sally at unexpected points to attack the enemy. And along the route of the enemy's approach for a distance of some two thousand miles lie numerous islands of the Pacific under Japan's mandate, suitable not only as observation points from which the Japanese admiralty can be kept fully informed of hostile movements, but also as hiding places for submarines and aëroplanes, which can slip out and harry passing ships and attack them from the rear.

The United States is far from the scene of the struggle, a voyage of 6000 miles. The American fleet must accept battle after a long cruise, with supplies and fuel low, machinery in uncertain condition, crews weary by constant vigil against submarine attack from front, flank, and rear. After a battle, there is the problem of refitting damaged ships, to say nothing of replenishing the fuel and stores of the entire fleet. The United States has three possible bases: the Philippines, about a thousand miles from the probable scene of conflict, Guam, fifteen hundred miles distant, and the Hawaiian Islands, over three thousand miles away. Speed of "turn about" constitutes a virtual increase of ships. A Japanese ship running short of fuel can visit its base about two to three hundred miles away and be back in action again in a third the time of the American ship with its base a thousand miles off. The American ship, also, must return to its base more promptly, because it uses up a larger proportion of its supplies in the trip. It is calculated that we must have at least five vessels to Japan's three to be on an equality.

Naval experts, moreover, agree that to engage in a modern naval battle at a distance of more than five hundred miles from bases adequately equipped with docks and facilities for repairing ships, and sufficiently well fortified to withstand bombardment of the enemy, is possible only with very greatly superior forces. Admiral Jellicoe reported to the British Admiralty, October, 1914, that it would be rash to give battle in the southern part of the North Sea, about five hundred miles from the British bases, against a German fleet three quarters the strength; and the Admiral's views were indorsed as thoroughly justified. But it is doubtful whether the United States can count upon retaining even her remote bases in the Philippines and Guam. They are so weakly fortified and so much further from the United States than from Japan, that Japan can easily seize them long before assistance could arrive. We might possibly obtain the use of the British base and dry-docks at Hongkong, but Hongkong is not invulnerable, and British main reënforcements are even further away than ours, about 10,000 miles distant. To supply our battle fleet by transports would require an armada of several hundred ships, and would necessitate either sending our entire battle fleet to escort them, or dividing the battle fleet, and thus weakening each division to such a degree as to open the best possible opportunity for attack by the full force of Japan's strength.

One need not be a naval strategist to appreciate that whatever may be the precise strength of each country, Japan's advantages and our disadvantages go far to equalize them. War with Japan at best would be a thankless task. Losses for the United States must be far greater than those we can inflict upon Japan. . . And all for the sake of a principle.

On the other hand, it is hardly possible that any administration could survive the stigma attaching to an open reversal of our policy, the frank desertion of China. During the Peace Conference, it is true, Japan demonstrated to her satisfaction that the United States can easily be isolated in her policy and forced to sacrifice China for other interests. We made amends for our desertion later by our efforts in her behalf at the Washington Conference, but another time China might be less fortunate.

And if Japan should eventually reach her objective, with the resources of China her own to develop, with 400 million serfs to command, and all under her own powerful central control — Germany's achievement would appear small in comparison! The mere matter of principle, a generous policy toward a weak foreign country on the other side of the earth, becomes a matter of self-preservation. Between the possible ultimate domination of the world by the yellow race and the maintenance of the superiority of the white race, between militaristic autocracy and democracy, stands the United States. Japan "at the cross roads"? China, "at the cross roads"? Their roads are already determined, the one by her necessity, the other by her inherent characteristics. The United States alone has before her a true choice! This is our "Eastern Problem."

CHAPTER XIII

MALAYSIA OR THE EAST INDIES

The Philippines, our East Indian possessions, are both economically and strategically important in our Far Eastern relations. Malaysia as a whole is of interest as a source of materials, rather than as a market for our manufactures. Rubber production has ample room for expansion; tin, of which the United States is the greatest consumer, offers opportunity for American enterprise; the coconut is of interest for its oil; and the Philippines enjoy a natural monopoly of manila hemp production. Tobacco, sugar, coffee, and petroleum are of chief interest to Europe. As a field for American enterprise and investment, Malaysia offers excellent opportunities.

The Philippines, Our Outpost in the East Indies

It is appropriate that we should turn next to the consideration of that vast archipelago variously known as the East Indies, the Malay Archipelago, or Malaysia, for the Philippines, the northernmost group of these islands — our most distant colonial possession — are both strategically and economically important in relation to the Far Eastern Problem.

The Philippines came into our hands at the conclusion of the Spanish-American War, when they were ceded by Spain to the United States for $20,000,000. Although they are thus true possessions, duly bought and paid for, the United States has felt herself bound by a certain moral obligation to assist the Filipinos to self-government. The war was occasioned, it will be remembered, by Spanish misrule in Cuba. The Philippines had also been suffering under Spain's tyranny, and had made numerous attempts to throw off her yoke. At the close of the war, therefore, it was a severe disappointment when it was learned that they had simply changed masters.

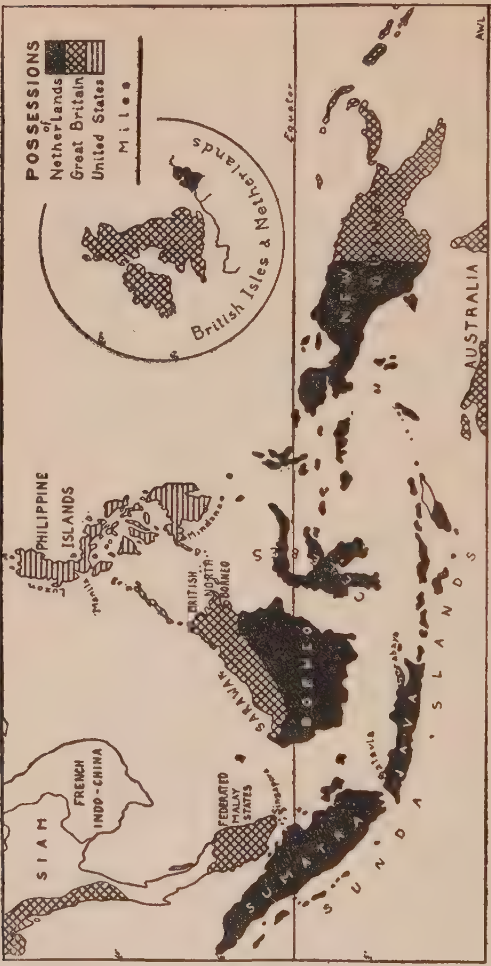

FIG. 58. Malaysia or the East Indies
(Showing possession, and with inset of Great Britain and the Netherlands for comparison of size.)

Three centuries of Spanish oppression, however, cannot be considered an adequate training for self-government, and there were still upwards of a million wild Moros roaming the islands. Freedom for such a people would be dangerous, especially to themselves. Nor would it have been many years before the Philippines were part of the Japanese Empire.

The government that has actually been accorded the Philippines by the United States has sought to create conditions under which the natives should have opportunity to develop the best that was in them, to awaken in a diverse and scattered people some consciousness of race unity and a sense of nationality, to educate them to a capacity for self-government, to reduce illiteracy, and to train in them a practical ability in contrast to their inherited prejudice against manual labor. Much has been accomplished, in spite of sundry mistakes, but it is very questionable whether they have yet attained the position where independence would mean anything more than liberty for misrule and a permanent liability upon the United States for their protection against aggression.

Moreover, other considerations complicate the situation. Economically, the Philippines may be valuable as an entrepôt or distributing center for our trade with various points of the Far East, especially southern China and the British and Dutch East Indies. Within a radius of 1700 miles live over 125 million people; a radius of 3500 miles would reach a population of 761 millions. Hitherto, indeed, our hopes in this direction have been disappointed. Only 2% of the imports into the Philippines are reëxported. But the islands are also of certain strategic importance. They afford the nearest base of operations for our navy in case of war with Japan. San Francisco is 6221 miles from Japan; the Hawaiian Islands, 3400 miles; the Philippines, 1700 miles (from Yokohama).

Malaysia: Descriptive Data

With this slight reference to the relation of the Philippines to the Far Eastern Question, we may proceed to the consideration of the region as a whole. The Malay Archipelago consists of three sweeping chains of islands, lying along the equator, for the most part within 10° north and south latitude. They reach from the southeast corner of Asia to a point north of Australia, a distance of some 4000 miles. The major islands of the southernmost chain are Sumatra and Java. Borneo, the Celebes, and New Guinea* or Papua are the largest in the central chain. The third group of Islands, the Philippines, instead of running parallel with the others, swings northward at a point above Borneo and the Celebes, reaching about 19° north latitude. Mindanao and Luzon are the largest. There are 463 islands over a square mile in area in this group. We may also include in the region the Malay Peninsula itself, part of the Asiatic continent, and the island of Ceylon, more properly included with India but taken as part of the East Indies in our federal statistics.

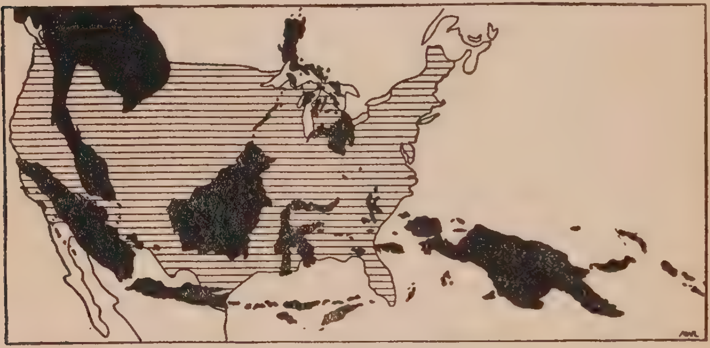

FIG. 59. Area and Extent of Malaysia.
(Compared with the United States.)

The total area of the region is approximately a million square miles; the population, slightly under 70 millions. Seventy per cent of the area and eighty per cent of the population belong to Holland. Borneo, the largest island, is 286,000 square miles, but over half of the population, 36 millions, is concentrated on Java, whose area is only 50,557 square miles (giving a density of 700 persons per square mile).

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* British New Guinea belongs politically to Australia and ethnographically with the smaller islands still further east, the Solomon Islands and Fiji Islands, etc., comprising what is known as Melanesia.

Area and Population of Malaysia

	Area	Population
Philippines (U. S.)	115,000 sq. mi.	10,610,000
Dutch East Indies (Holland)	733,000	49,160,000
North Borneo and Sarawak (Gt. Britain)	73,000	890,000
Papua	90,500	370,000
British Straits Settlements (Gt. Britain)	1,600	860,000
Federated Malay States (Gt. Britain)	27,600	1,350,000
Protected Malay States (Gt. Britain)	23,300	1,050,000
Ceylon (Gt. Britain) . . .	25,500	4,500,000
Total	1,089,500 sq. mi.	68,790,000

Suggestive of the climate is a story told of the ghost of a dissolute planter, who had died of sunstroke, which returned shortly to his widow and begged her to "send down my blankets." The mean annual temperature is about 80° F., ranging from 60° to 100°. The humidity, however, is more trying than the heat alone. In Manila it frequently reaches 100° and the mean is about 80° with a daily range from 62° to 93°. Fortunately cloudiness mitigates the glare of the sun, whose rays at the equator, of course, strike perpendicularly. In some places the sun is obscured for three quarters of the possible hours of daylight. Rainfall varies greatly in different parts owing to the influence of the high mountains upon prevailing winds. At some of the meteorological stations in the Philippines, an annual rainfall of only 25 inches is recorded; at others over 115 inches (about 10 feet). In Java at Kranggan, a precipitation of 27 feet has been recorded. Most of the official observations give an average of 80 to 120 inches. Some extreme figures have been recorded, such as in the three days' storm of Sept. 1–3, 1914, when in one place over 18.6 inches fell; and Manila notes a record of 20 inches in one storm, Sept. 24–26, 1867.

As a Market for American Manufactures

We are interested in the East Indies primarily as a source of materials and a place for capital investment. We buy over twice as much as we sell there:

East Indian Trade with the United States
(Average annual, 1919/21)

	Exports to United States	Imports from United States	Excess of Exports	Ratio of Imports to Exports
Philippines . .	$ 77.2 mil.	$ 72.4 mil.	$ 4.8 mil.	1 : 1.07
Straits Settlements	131.5	12.8	118.7	1 : 10.3
Other British East Indies . .	27.3	2.0	25.3	1 : 13.7
Dutch East Indies	92.7	46.0	46.7	1 : 2.0
Total . . .	328.7	133.2	195.5	1 : 2.47

In their total trade, also, the East Indies show the same excess of exports over imports. The Dutch East Indies regularly export about double the value of what they purchase. Statistics for the Straits Settlements are complicated by the fact that Singapore is a free port and an entrepôt for this entire region, so that a large proportion of the trade indicated is really internal trade for the region as a whole: the "imports" are goods collected from surrounding points for convenience in shipping; the "exports" are largely commodities distributed locally from Singapore. This is very evident if we re-group the trade statistics of Singapore according to the location of the countries as within or without the region. We find an excess of imports collected from surrounding points, but an excess of exports to Europe and the United States:

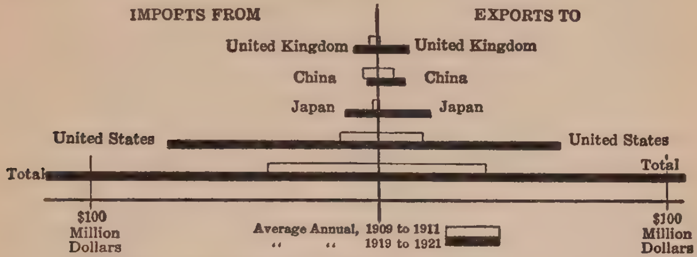

FIG. 60. Foreign Trade of the Philippines, Average Annual, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

Trade Balance of the Straits Settlements, 1919
(Major countries)

	IMPORTS FROM	EXPORTS TO	EXCESS IMPORTS	EXCESS EXPORTS
United Kingdom . .	£ 6.8 mil.	£15.8 mil.		£ 9.0 mil.
United States	3.85	35.3		31.4
Total	10.65	51.1		40.4
Federated Malay States	28.9	15.1	13.8	
Dutch possessions . .	20.3	10.0	10.3	
Siam	10.7	3.1	7.6	
India	8.0	4.7	3.3	
Hongkong	9.3	3.2	6.1	
French possessions . .	4.0	2.5	1.5	
Australia	3.4	.2	3.2	
Total	84.6	38.8	45.8	

The composition of the population may be sufficient to explain the narrowness of the East Indies as a market for consumers' goods. In the Straits Settlements only 1.1% of the inhabitants are whites; in the Dutch East Indies, 0.2%; in the Philippines, 0.1%. The complete household furniture of a European can be bought for three to five hundred dollars, and the natives lead a simple, contented life, requiring very little beyond their immediate environment. The Javanese are comparatively highly civilized, yet their houses are of the simplest: the floor of beaten earth, the roof of leaves, the furniture a wooden couch, a few mats and cushions, a chair or two, a table, and perhaps a chest. Their clothing is a cotton skirt for both sexes, a cotton vest for the man, and a kemben or wide cotton bandage for the woman. The people on the more remote islands are still savages. They wear no clothing, or only a piece of bark cloth. In some places there are cannibals and head hunters.

The "balance of trade" is maintained by invisible items. Among such items the economist usually places "interest on investments," but he draws no sharp line between the six per cent, of which we are accustomed to think, and an annual tribute paid to the home governments and absentee owners living in Holland and Great Britain. Under the Dutch governor Van den Bosch, the East Indies practically paid the debts of the home country. (So much for what we call without discrimination a "favorable balance of trade"!) We need not expect that the East Indies will ever become a market for our manufactured articles proportionate to our purchases. Payments for our imports will largely be made, not directly to the East Indies, but to the European owners — and therefore, let us note in passing, in the form of materials and foodstuffs. How much of our customary heavy excess of exports to Holland and Great Britain may at present be accounted for thus must be, of course, a matter of conjecture.

While the heavy balance of our purchases from the East Indies over our sales will doubtless remain a permanent feature of this trade, it will be of double interest to note the increase in our exports to these markets. Before the War, the Dutch East Indies used to obtain from 1.5% to 2% of their imports from the United States. In 1917 and 1918 the proportion rose to 10%, and in 1919 to 20%. Although our advantage may decline somewhat — especially if manufacturers in Japan and China are able to profit by their proximity — our goods have become known and appreciated. During the War Japan made the mistake of dumping inferior goods upon the market, so that now she is in considerable disrepute. The rapid strides being made throughout the region in mining and agriculture promise a growing market for appropriate producers' goods, machinery, tools, and equipment in which the United States enjoys a marked superiority. We may increase our sales here of sugar-mill and saw-mill machinery, oil-well and mining equipment, railway material for plantation lines, etc. Since, however, the markets for these manufactures are best determined by reference to the specific products themselves, we may turn without further delay to this aspect of our study.

Products: Rubber, Tin, Coconuts, etc.

Three commodities stand out beyond all others: rubber, tin, and coconut products. Other articles we obtain are

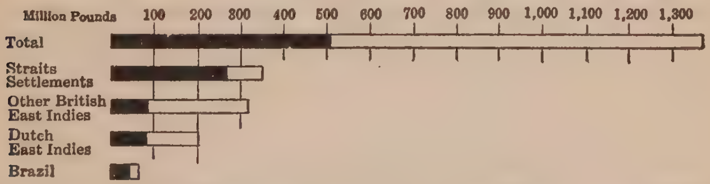

Fig. 61. Rubber-Producing Countries of the World, and United States Rubber Imports.

(Showing the total output of each country, average annual, 1919/21; and the portion imported by the United States, in black.)

hemp, tobacco, sugar, and coffee. Our average imports of these articles during the years 1919/21 were as follows:

Chief Commodities We Import from the East Indies

	Imports from East Indies	Total United States Imports	Per Cent of Total from East Indies
Rubber	$150 mil.*	$178 mil.	84%
Tin	38*	47	80
Coconut products	33	41	80
Hemp	15	15	100
Tobacco	12	57	21
Coffee	6	222	2.6
Sugar	31	546	6

Rubber, it will be remembered, is indigenous in Brazil. Seeds of the rubber tree were brought to the East in 1876, and it was found that conditions were favorable for its growth. From 1875 to 1880 coffee plantations in Ceylon experienced ruinous devastation from a leaf disease. In their extremity the planters turned to the cultivation of tea and cinchona. From 1881 to 1891 or so seeds from the rubber plants sent from Brazil were freely distributed to the planters, to be grown as shade trees for the tea. The rubber, however, soon became more valuable than the tea, so that cultivation of the latter was dropped. The acreage of rubber plantations thereafter increased by leaps and bounds. From Ceylon, rubber growing spread to the Malay Peninsula, where the trees were at first interplanted with coffee and sugar, and later to the Dutch possessions. Today Ceylon has about 400,000 acres, the Malay Peninsula probably over a million, and the Dutch East Indies, 600,000 or more.

At first it was supposed that the tree could grow only upon swampy land similar to its original habitat in the Amazon region, but it was found to thrive at higher altitudes. There are rubber-growing districts 1700 feet above sea level in Ceylon, and trees have been planted by experiment stations in the Malay States as high as 2000 feet, though there are few estates over 300 feet above sea level. The amount of land available for expansion must be counted by millions of acres. In Sumatra alone, where two thirds of the island is still untouched, and on the Malay Peninsula improved transportation facilities will open up vast new areas for exploitation. The labor supply is not evenly distributed, so that relative shortage is experienced in some places, but in general it is ample, and particular localities can readily be supplied by immigration from overcrowded regions or from China.

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* Including estimated imports via Europe.

Large-scale rubber production, under well-trained and educated managers, is capable of economies that generally go with large-scale enterprise. High-grade machinery and equipment can be put into use, and improvements introduced. Large units, also, are more attractive for capital investment, as compared with the numerous poorly controlled and ill-directed independent collectors in Brazil. Until Brazil can introduce a new system into her rubber industry, it is probable that most of the world's rubber will be obtained from the East Indies. At present the United States buys 84% of her rubber from the East.

The second product we obtain from the East Indies is tin. Our purchases of this metal amount in value to a third or a quarter those of rubber. As a commodity it is far less essential. The primary use of tin (about 33%) is for tin plate, familiar to us as cans to contain foods, etc.; 20% is used for solder, 14% in alloys for babbitt metal and other bearing metals, and 5% in brass and bronze. In its chief use, therefore, tin may be largely replaced by paper and cardboard, and glass jars; while for certain foods dehydration may take the place of canning. At present, the United States is the largest consumer of tin, using about two thirds of the total world's output.

Nevertheless, we have to import almost all we use, for our own ore deposits are very meager. Great Britain controls over half the tin deposits of the world, and of the world's smelter capacity fifty-seven per cent by direct capital ownership, with fifteen per cent more by affiliation. Indeed, Cornwall, England, was the very cradle of the industry, tin having been mined there since prehistoric times. For long Great Britain used to lead the world in tin mining. As her

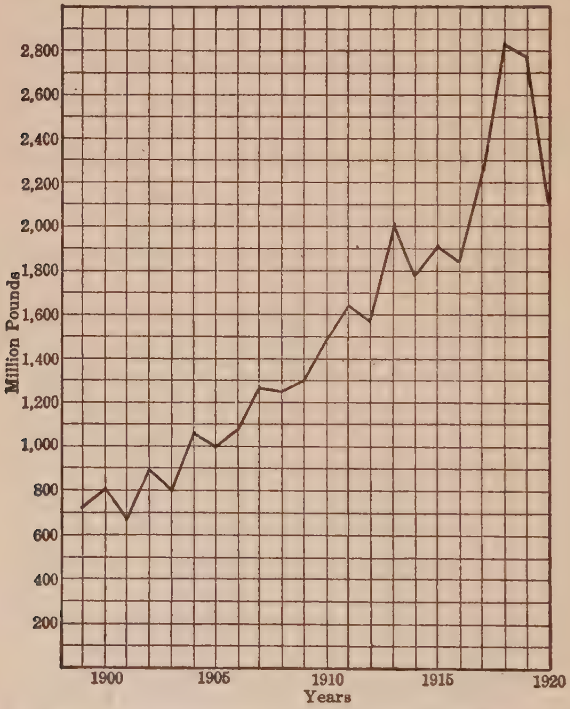

Fig. 62. Tin-plate Consumption of the United States, 1899 to 1920.

deposits gradually became exhausted (about 1.75 million tons have been taken out), and the demand for tin increased, the British smelters extended their control to foreign sources of supply. At first they imported ores, but it was found more economical, of course, to refine the ore as near the mines as possible in order to save freight. Today, Singapore is the largest tin-smelting center of the world.

Hitherto, Malaya has produced most of the tin ore of this region (about 30% now of the world's annual output), and smelter control has been retained in British hands by imposition of a prohibitive export duty upon all ores sent out for treatment except to the United Kingdom, Australia, or the Straits Settlements — a duty imposed when the Standard Oil Company, one of the largest users of tin cans, decided to ship tin ore as a return cargo from the Far East to be smelted at its plant at Bayonne, N. J. The output of Malaya, however, is declining, and the islands of Banka, Billiton, and Singkep, Dutch possessions off the coast of Sumatra, already produce 20% of the world's output. Other deposits in Sumatra are awaiting development. Although British controlled mines in Malaya and in Siam are sufficient to maintain a strong smelting industry in Singapore, affording economies of large-scale production that must attract ores from the near-by Dutch mines, it might not be impossible for American smelters to establish themselves in Sumatra

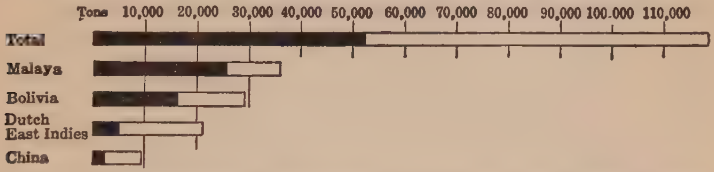

FIG. 63. Tin-Producing Countries of the World, and United States Tin Imports.
(Showing the total output of each country, average annual, 1919/21; and the portion imported by the United States, in black.)

or in the Philippines and to exploit deposits in the Dutch East Indies.

Bolivia affords the only other great source of tin. Her mines are not under British control either politically or financially, and give the best immediate promise, perhaps, of those of any of the tin-producing countries. Also the United States enjoys a certain advantage of greater proximity. The ores mined in Bolivia are still of high grade, carrying at least 10% pure metal. Hitherto it has not been possible, on account of lack of fuel, to smelt the ore near the mines. It had to be reduced by hand picking to about 60% metallic content, shipped under the name "barilla." If the new method of electromagnetic separation, which is receiving considerable attention at present, can be successfully employed, the cost of transportation will be reduced and we may obtain a greater quantity of our tin from Bolivia.

There is a world smelting capacity 17% greater than is required by actual tin consumption. Whether contraction will occur in British smelting, and the American industry obtain ores from the British East Indies and Bolivia, or whether our smelting industry will disappear and we shall continue to depend upon Great Britain, remains to be seen.

The coconut is one of the world's most useful trees. To the native, it gives food, drink, shelter, and numerous utensils. The trunk provides timber for houses and bridges and may be hollowed out for water pipes. The leaves are used for thatching roofs, for walls of houses, for mats, for beds, for dishes, for baskets. Young leaf buds are eaten as a vegetable. From the sap is made palm wine, vinegar, yeast, and sugar. The coarse, fibrous covering of the shell of the nut, "coir fiber," is so strong and durable that it is a favorite material for doormats and brushes which receive the severest possible use, and is especially suitable for twine and ropes for ships, for, although it rots in fresh water and snaps in frost, it is strengthened by salt water, and is so buoyant that it floats. The shell of the nut can be fashioned into spoons, cups, bowls, or bottles. The meat of the nut ("copra") may be eaten raw or cooked, and when immature has valuable medicinal properties. The milk is a cooling beverage.

Our own interest in the coconut is confined chiefly to the meat of the nut, which contains valuable oil. Man obtains food fats from animals — from their bodies in meat, or from their milk as butter — and from plants. Northern peoples have depended chiefly upon animal fats; southern peoples on vegetable fats. As population has increased, and animals have risen in value, the cheaper vegetable fats have found an ever broadening market. During the War, when the pressure of economy was greatest, vegetable fats and oils produced in the United States amounted to 30% more than the animal product. Cotton seed, until recently thrown out in piles to rot or to be burned, is now utilized for its oil content. Similarly peanuts and soya beans have come into prominence as sources of fats. They are easily grown and will soon form an important part in our food supply.

The coconut yields about 50 to 75% of oil, the higher percentage being obtained by the slow process of hot-air drying. Because of its strong taste, the oil was formerly used only for making soap, but it has been discovered that the chemical admixture of hydrogen makes it perfectly suitable for food. In a single decade our imports of coconut oil have increased nearly five times, and of "copra," the meat of the coconut, nine times:

United States Imports of Coconut Oil and Copra
(Average annual)

	1909/11		1919/21	
Coconut oil	50.65 mil. lbs.	$3.2 mil.	229 mil. lbs.	$21 mil.
Copra	27.66	1.9	253	20

The copra imported into the United States is collected from Australia and the innumerable islands of the Pacific. Only 9% comes from the Dutch East Indies and 8% from the Philippines. Our coconut oil, however, comes chiefly from the Philippines, about 75%, and 21% from the Dutch East Indies.

The coconut tree grows near the sea anywhere in the tropics, and on almost any kind of soil — an index of the dividing line between the tropical and subtropical zones. Owing to the tree's preference for coastal regions and the lightness and durability of the nut, it is always the first plant to gain a foothold on newly forming islands. Each tree bears about a hundred nuts per annum, though under favorable circumstances they have been known to have as many as four hundred. They bear for seventy to eighty years, beginning about six years after planting. A third of a ton of copra per acre of land is said to be the normal yield. The labor required is simply to collect the fallen nuts when convenient — they keep a long time without spoiling — to split them, remove and dry the kernels, and pack in bags for shipment to the oil mill. The cost can be more than offset by cattle and sheep raising, utilizing the waste as forage after expression of the oil, and leaving the copra returns as clear profit. The natives attend to the entire task. The trees require no attention. The owner can hang up his hammock and collect the proceeds, insured of profit and ease for his lifetime.

Manila hemp stands fourth among the United States' imports from the East Indies. In contrast with the coconut palm, which is ubiquitous throughout the tropics, the abacá, from which Manila hemp is obtained, is grown nowhere outside of the Philippines. All efforts to transplant the abacá have been commercially unsuccessful.

The plant is a non-edible banana, somewhat similar to the wild banana in the jungles of Central America. The fiber is taken from the leaf sheaths that surround the central flower stem or stalk. Plants reach maturity in about two and a half years, and attain a height of fifteen to twenty-five feet, with a stalk a foot or more in diameter. They are then cut down and the leaf sheaths, which grow compactly together in overlapping layers, are cut into strips two or three inches wide. The thick, pulpy inner portion is torn away, leaving the outer bark of the leaf stem. This is passed again and again between the edge of a knife blade and a wooden plane, each drawing leaving the fiber cleaner and finer — and lighter in weight. The extra price of the finer grades, so the natives claim, does not compensate for the additional labor and loss of weight.

If a machine could be invented to strip Manila hemp economically without injury to the fiber, it might compete at a great advantage with other fibers, such as Yucatan sisal, for it is reputed the strongest and best of all fibers. A rope about an inch in diameter and twelve feet long can sustain two tons weight. The finer grades may be woven into fabrics, making an extremely durable cloth when mixed with cotton. Exports are very irregular. The maximum, 193,000 tons, was reached in 1912.

Exports of Manila Hemp
(Average annual)

1899/01	105,000 tons
1909/11	176,000
1919/21	133,000

Improved inspection and grading may do something to stimulate exports. There is ample room for expansion. Much of the hemp that is brought to market is still gathered from wild plants, but the industry might be greatly extended by systematic planting and cultivation. The plants require humidity, fertile soil, land moist but not too swampy, protection from sun and wind — and there are thousands of acres of such land available on the wooded mountain slopes of Mindanao, Luzon, and many of the smaller islands. Until such a machine for stripping can be devised, however, the industry must remain in about the same position as the cotton industry before Whitney invented the gin.

Philippine tobacco comes to us chiefly in the form of cigars; the United States takes about 75% of the exports. The area for raising tobacco, however, is limited, since it cannot be grown well within ten miles of the seacoast. Only the two largest islands, Mindanao and Luzon, have the necessary conditions. Of greater interest, though less in total value of our imports, is the leaf tobacco we get from the Dutch East Indies (mostly via Holland). The climate and soil of Sumatra produce a leaf of rather neutral flavor, exceptionally glossy, of good color, and elastic. These qualities make it exactly suitable for cigar wrappers — two pounds will wrap a thousand cigars — and for such we import it.

Although cane sugar is an important product of the East Indies, the United States has little interest in this remote source of supply, except as an auxiliary to Cuba. Most of the exports are sent to Asiatic countries and to Europe. It is the second most important export from the Philippines (25% of her total exports, or almost equal to her exports of coconut products). Java is the third greatest sugar producer in the world — over 1.5 million tons per annum (1919/21), as compared with Cuba, 3.9 million tons, and India, 2.75 million tons. She has an ample labor supply, which is Cuba's chief handicap, and by intensive methods of cultivation her yield of cane per acre is 42 tons as compared with Cuba's 28 tons. But the very density of her population and consequent demands upon her land for the production of other food crops, especially rice, leaves Java much less room for expansion.

Our interest in Java coffee, also, is very much less than it used to be. Only two to three per cent of our imports now come from the East Indies.

Petroleum has suddenly assumed very great importance. Eighteen million barrels were produced in the Dutch East Indies in 1921, making this the fourth greatest oil region in the world: 62% was produced in Borneo, 23% in Sumatra, and 15% in Java. Unfortunately for us, however, the petroleum industry throughout the Dutch East Indies is controlled by the Royal Dutch and the Shell Transport and Trading companies. In 1914 the Standard Oil Company made application to the Dutch government for a concession to exploit the Sumatra field. The application was pigeonholed during the War, and in November, 1920, the Dutch government suddenly sprang upon the legislature a bill whereby a complete monopoly of the field was handed over to the British controlled companies (the Royal Dutch is under British capital control). Although the secret diplomacy of the administration greatly incensed the Dutch legislature, the bill was eventually passed. Subsidiary companies have been established jointly: the Batavia Petroleum Company, which manages the mines and refineries, the Anglo-Saxon Company, which attends to the transport of oil, and the British Petroleum Company of London, which transacts the sales. The importance to Great Britain of a fueling station close to her great trading center, Singapore, and directly on the main ocean routes, cannot be exaggerated. Our loss is almost proportionately great.

As a Field for Capital Investment

From this brief review of the principal products of Malaysia it will appear that the region offers excellent opportunities for the investment of capital. Our requirements for rubber and coconut products will doubtless increase indefinitely. There is ample room for production of both in the East Indies. Tin is important, and it will be advantageous for us as the chief consuming country to obtain concessions to exploit deposits in the Dutch East Indies and if possible establish our own smelteries in the region. Hemp deserves greater attention than it has yet received. Tobacco, sugar, and coffee are of more interest to Europe than to the United States. Of utmost importance to us would be the acquisition of petroleum deposits, if any such possibility still remains. From the Philippines, our own possessions, we obtain most of our coconut products and all of our hemp, and plans are on foot to start rubber plantations in order to have a source of supply free from foreign control. The Dutch East Indies, however, should become the most important source of supply of both rubber and tin, although at present we get more from the British possessions.

Sumatra is richly endowed with great mineral wealth, gold, silver, tin, copper. There are extensive coal measures. Forests contain valuable woods of all kinds — teak and ebony as well as cheaper timber — and yield various useful gums and resins. Roads and railways will soon bring these resources within reach, and with the help of imported labor, especially Chinese (the native tribes are intractable), will soon transform the island into one of the richest in the world. Borneo, the Celebes, and other islands offer similar opportunities. Profit from investments is assured by the increasing demand for their products.

The Philippines, of course, are particularly desirable for American investment. The British East Indies are a less favorable field, because so extensively monopolized and controlled by British interests, which, as times goes on, will very likely become increasingly antagonistic to American expansion. The Dutch East Indies are very solicitous for American enterprise, and the colonial government, in its program for development, offers conditions designed to be most attractive for investment in rubber plantations, rice and oil mills, and various other industrial undertakings. With the exception of the Philippines, indeed, probably nowhere in the East will American enterprise meet with fewer obstacles. Although Dutch is the official language, English is used freely in commercial transactions. Banking facilities are excellent. It may be remembered also that it is to Holland as well as to England that the United States has been indebted for much of her political structure and legal procedure. In the Dutch East Indies we do not have to adapt ourselves to a new psychology, new customs and traditions, as in China and Japan.

Holland has resolved to organize her colonial empire instead of exploiting it, as hitherto. To that end, she is exerting greatest care in the selection of her officials. All except the highest are chosen by competitive examination to fill the particular vacancies as they occur. No one has a finer sense of his duties and responsibilities than the government official of "Netherlands India." The colonial government works hand in hand with the native princes and chiefs. The regent, a native, has at his side the "Resident" or European adviser; the district "wedono," a native, has a Dutch "comptroller," and so on down to the petty officials. The Dutch advisers are especially chosen from philological experts, familiar with the language and in sympathy with the customs and characteristics of the natives.

CHAPTER XIV

INDIA

India is one of the greatest countries of the world in agricultural production (her mineral output is slight), but her production per capita is very low. Famines are frequent. Efforts of the British government to reduce this scourge have accomplished comparatively little, owing to the obstacle of established customs and religious tenets. Our purchases of jute, goatskins, and shellac are irregular; and as a market for our manufactures, the opportunity offered is not in proportion to her population. The adverse relations between India and Great Britain, who supplies most of her imports, promise little advantage to the American exporter.

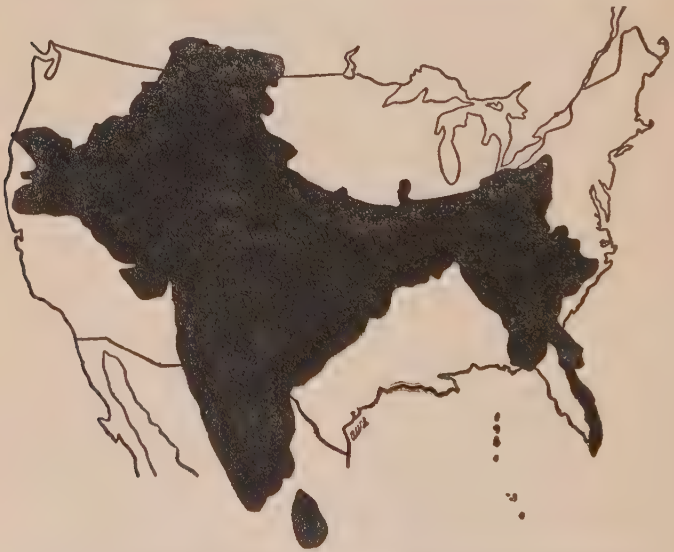

FIG. 64. Area of India. (Compared with the United States.)

A Land of Contrasts — Hope and Despair

INDIA is a country of magnitudes and contrasts; of potentialities and despair; a problem and a mystery. In size India is one of the greatest countries in the world, with an area of 1.8 million square miles and a population of 319 millions. In agricultural production — almost 75% of the population is occupied in farming — India stands among the foremost countries. In wheat production she is third, following the United States and Russia in Europe (normal); in her yield of corn she is fourth, following the United States, Argentina, and Italy. In rice production she is exceeded only by China; in sugar, by Cuba; in flaxseed, by Argentina. Eighty-five per cent of the world's rapeseed is grown in India. She is first in the cultivation of tea, producing more than Ceylon, the two together accounting for 75% of the world's total supply. She is second to the United States in tobacco and cotton. She has a monopoly of the world's jute. Over 25% of the world's cattle are in India — more than twice as many as in the United States. Although she stands only fourth or fifth as a sheep-raising country, she is first in the number of her goats, having as many as the whole of Europe.

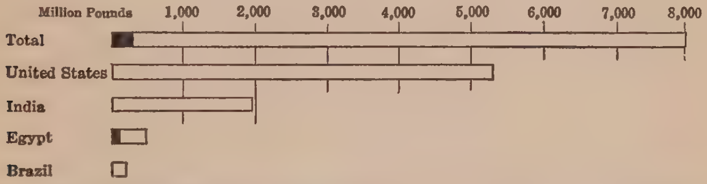

FIG. 65. Cotton-Producing Countries of the World,* and United States Cotton Imports.
(Showing the total output of each country, average annual, 1919/21; and the portion imported by the United States, in black.)

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* Based on statistics of the International Institute of Agriculture, which omits China on account of incompleteness of data.

Agricultural Production of India in Comparison with other
Countries, 1919/21
(In millions)

Wheat (tons): United States, 21.6; (Russia, 12.5); **India, 9.1**
Corn (tons): United States, 73; Argentina, 5.3; Italy, 2.4; **India, 2.2**
Rice (tons): China, 120; **India, 47**
Sugar (tons): Cuba, 3.9; **India, 2.8**; Java, 1.5
Flaxseed (tons): Argentina, .84; **India, .42**
Tea (pounds): **India, 333**; Ceylon, 192
Rapeseed (tons): **India, 1.1**
Cotton (tons): United States, 2.5; **India, .8**
Jute (tons): **India, 2**
Cattle (number, '21): **India, 140**; United States, 66
Sheep (number, '21): Australia, 75; Argentina, 45; United States, 42; (Russia, 36); **India, 35**
Goats (number, '21): **India, 24**; Turkey, 19

India's mineral production is far less conspicuous than her agricultural. Of the major industrial minerals, she appears to have little. Her output of iron ore, 560,000 tons per annum yielding 300,000 tons of pig iron, is one half of one per cent of the world's output. Coal fields stretch across the peninsula from Bombay to the northeast corner, but the total reserves are estimated at less than half Great Britain's or 2% of our own. She produces petroleum, at present 1% of the world's output. In some of the minor minerals she stands higher. Her manganese production is a quarter of the world's output; tungsten, a fifth; she is the largest source of supply for mica (60%); and since 1914, of monazite sand. Her gold production is 2.5 to 3% of the world's. Silver, lead, tin, etc., are also found. Her minerals, however, cannot be considered a source of any great wealth. Her total production of all minerals during 1918 and 1919 came to about 2% of the value of the mineral production in the United States during the same years.

With all her enormous wealth of agricultural production, India is poverty stricken and on the verge of starvation.

Her output scarcely suffices for her own needs. Her consumption of wheat per capita is a sixth of ours. Although she exports 2.5 million bushels in flour, she can ill spare a pound. She should be a wheat importer. Similarly she exports 2% of her total rice crop. China, with double the per capita rice consumption, has an excess balance of imports. Of our total corn consumption — 1355 pounds per capita — perhaps 55 pounds are eaten directly, and 1300 pounds in the form of corn-fed beef, pork, etc. The East Indians as a rule do not eat meat. Nevertheless, their total corn consumption comes to only 15 pounds per capita. India imports sugar — 6% of her total imports! Most of her tobacco she consumes at home.

Every five years famine visits one part of the country or another — particularly the Deccan, where people expect hardly more than two good crops out of five. Agricultural prosperity is entirely dependent upon the "monsoon" rains. From May to October the "monsoon" winds blow from the tropical south seas, and, laden with moisture, deluge the country in their direct path. Where the Assam Hills, 4000 feet high, obstruct the path of the winds at the north of the Bay of Bengal, the rainfall is the heaviest in the world — normally 450 inches, occasionally as much as 50 feet. Toward the west of the peninsula, the precipitation is very much less. For two or three weeks in December, there is a gentle rain from the north, after which the dry season sets in, lasting from February to May.

The vital period for agriculture is from June to September. The December rains affect only the winter crops. The famines are due to the irregularity of the rainfall. The monsoon rain may be concentrated in a few tremendous downpours, instead of being spread over the normal three and a half months. Sometimes half the average annual precipitation will fall in twenty-four hours. In Calcutta seven inches, a tenth of the normal annual precipitation, once fell within a single hour. The December rains may fail entirely.

Until British occupation, the periodic catastrophes, wiping out millions of lives, were simply accepted as divine visitations. To Western initiative, they present a challenge. Every effort has been made to prevent or mitigate the menace of famine. Railroads have been built to connect all parts of the country, so that food supplies may be speedily brought from unaffected regions to famine centers. The railway mileage, 20.4 miles per 1000 square miles, is about the same in proportion to area as Argentina's (19.6). Construction has been greatest in the states of Bengal, Bihar, United Provinces, and Punjab, for these, on the plain of the Ganges,

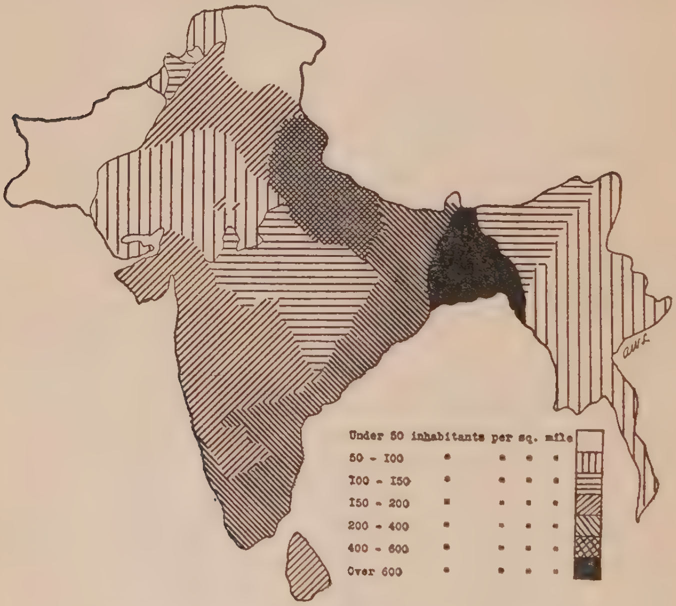

Fig. 66. Distribution of Population in India.

comprise India's agricultural regions par excellence, supporting on an area of about 327,000 square miles, or 30% of the area of British India, 55% of the total population.

Extensive irrigation works have been built to afford a steady supply of water in regions menaced by irregular or too scanty rainfall. Wells have been dug to reach ground water, which is used to irrigate 12 million acres. Tanks or reservoirs have been built for storage, to insure regularity of supply for 13 million acres more. Most ambitious are the canals. These provide water for 28 million acres, or 13% of the total cultivated area of British India.

The Department of Agriculture has exerted every effort to solve India's problem by improved methods of farming. Agricultural schools have been established. The Department analyzes soils, experiments with fertilizers, investigates insect pests, etc. Careful selection of seeds and the scientific breeding of cattle and sheep have been encouraged.

Finally, the government has not hestitated to grapple with the problem of direct relief, a task difficult in any country, but especially in India, where thousands fall victim to the suddenness, the irregularity, and the severity of the famines. To avoid giving assistance to impostors and demoralizing the sufferers by overindulgence on the one hand, and at the same time to avoid the sacrifice of life by too great particularity is well-nigh impossible. In the great famines of 1876–77 and 1899–1900 the maximum number in receipt of assistance at a single time was over four millions. In some districts, a quarter of the population was on one occasion or another dependent upon government relief.

Unsparing as Great Britain has been in her efforts to improve conditions in India, her actual accomplishment has been discouragingly slight. Her attempts to support famine districts by drawing upon supplies of prosperous sections has met with constant opposition. The fortunate regions do not wish to have the normal severity of their own living conditions made more onerous by sharing their food, even with the advantage of the higher profits.

In the highly developed sections, especially along the Ganges, where agricultural conditions have been most favorable and population has concentrated, changes in method have such far-reaching and intricate consequences as to be in many cases practically impossible. For instance, deep plowing to improve fertility involves larger and more expensive plows, larger plows require stronger draught oxen, these need heavier feeding, and so on. The cultivator simply cannot afford the cumulative outlay.

Native farmers near the canals fail to take advantage of the water supply. Twenty years of patient endeavor on the part of the authorities is often needed to get the people to use it. In 1918, during a food shortage, water enough to irrigate 20,000 acres was allowed to go to waste in the Godavari Canals. This is not wholly due to inertia on the part of the people, however, but to a bad system of property ownership. Fields are subdivided into such sizes and shapes as to make irrigation almost impossible. When a man dies his property is not only divided equally among his sons, but care is taken that each heir shall receive an equal part of the poor land as well as the good. This procedure results in minute "fragmentation" of holdings. In a village in the Poona district, the average size of a holding was 40 acres in 1771; at present 60% of the farms are under 5 acres, and most of them are broken up into tiny plots less than an acre in size. For a farmer to irrigate his scattered plots would obviously involve too great expense.

The evils resulting from fragmentation of holdings are not confined to irrigation alone. Systematic methods of agriculture, the orderly organization of labor or capital, etc., are out of the question. Mere waste of time in going from one plot to another is sometimes so great as to prevent the customary two crops per annum.

Any cure for this unhappy situation, such as changes in the law of inheritance, would transgress Hindu custom and arouse hatred and revolt. Hindu religion effectually blocks progress at every avenue. First there is the caste system: two to three thousand class groups artificially isolated, each with its prescribed rules of conduct, many of them in force for centuries. One cannot eat with any but a caste brother. Food must be cooked, also, by a fellow member as it is polluted by the mere shadow of any one of lower caste. Almost every occupation or profession has its caste, and thus becomes a holy calling. Each has its ideals and its prescribed methods handed down from father to son through generations, to alter which would be sacrilege. Tools are those that have been employed for hundreds of years. The farmers have not turned the smallness of their holdings to

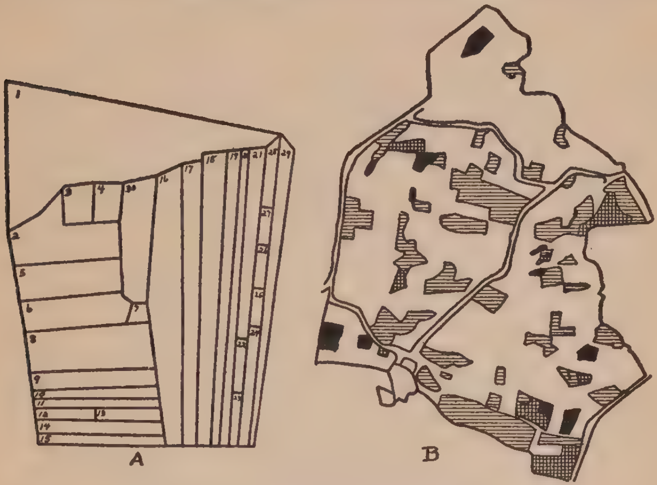

Fig. 67. Land Holdings in India.
(Showing, *A*, awkward shapes unsuitable for effective tillage; and *B*, "fragmentation" of holdings belonging to three men, as indicated by the shading. Copied from diagrams in G. Keatinge's "Agricultural Progress in Western India.")

advantage, as have the Japanese, by intensive cultivation, discarding the plow for the hoe, and increasing their output by manual labor. The unceasing pressure of population upon means of subsistence has not taught them, like the Chinese, new economies, such as the use of manures and sewage for fertilizer.

New castes are even now arising. A particular group of members of an old caste, for instance, may decide to enhance their importance in the eyes of others by renouncing the cultivation of some particular crop, and thereafter prohibiting intermarriage with members of the broader group.

Material progress runs counter to the fundamental teachings of the Hindu religion. Comfort, economic welfare, amusements are not what the East desires. Spiritual dignity and leisure are the ideals. Self-flagellation and asceticism are esteemed more highly than luxury and wealth. Industry and thrift are unknown. It is normal to be in debt, and the village money lender grips the community as closely as does the priest.

The evils of poverty are cumulative. It leads to underfeeding and general debility. The unsanitary living conditions bring disease. Malaria is rife; cholera is endemic. Constant in-breeding within the narrow limits of the caste perpetuates and increases the evils. The vitality of the race is being steadily reduced.

In short, while India's total agricultural production is enormous, her surplus for export is small, and exists at all only at the expense of her standard of living. A very slight increase in output throughout the farming community, indeed, would aggregate to a vast total increase, but the living conditions should be improved at the same time, and would more than offset any increase in production. However, prospects for a greater output are dubious. There is little area suitable for cultivation that is not already in use. The only opportunity is through improved methods and implements. But India is the most conservative country upon the face of the globe. The obstacles to the introduction of improvements, the expense involved, and above all the religious observances, are practically insuperable. Progress at best will be extremely slow; India, with all her potentialties, is a land of despair.

India's Commercial Products

Of India's products, we can list as of present commercial importance to the world jute, cotton, flaxseed and rapeseed, tea, the hides and skins of cattle, sheep, and goats, and a few minor minerals. Of these, jute stands foremost, 29% of her exports, and cotton second, 17%. Exports of her food grains are 11% of her total exports, but the proportion is declining and should properly disappear entirely. Seeds are 7%, tea 5%, and hides and skins 4%.

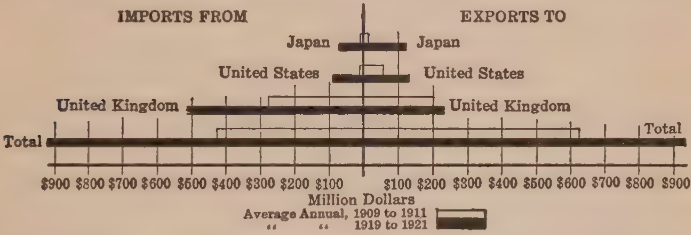

FIG. 68. Foreign Trade of India, Average Annual, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

To the United States, only two of these commodities are of interest. Jute and jute manufactures form fully 60% of our imports from India, and goatskins 18%. A third, but minor, product of India, shellac, amounts to 11% of our imports.

Jute is a fiber from the bark of a tall shrub, 5 to 15 feet in height and about an inch in diameter. It grows almost exclusively in India, principally in Bengal along the Ganges

River. The plant requires a hot, damp atmosphere, and prefers soil of alluvial formation. It is adapted to cultivation in our Gulf States from Texas to South Carolina, but would not pay on account of the labor cost. The seed is sown broadcast and requires little or no cultivation except thinning out, but when the bush matures (in about three months), it is harvested with a sickle, the stalks have to be sorted in three sizes as to length, and the bundles steeped in stagnant water to "ret" for two or three days to a month. At the end of that time, the coolie goes into the water waist deep, grasps a bunch of stalks, and thrashes the surface of the water until the bark is loosened and the fibers separated. They are then wrung out, hung on lines to dry, and finally baled for shipment. About 400 pounds of fiber is returned from an acre of land.

The chief advantage of jute as a fiber lies in its extreme cheapness. Aside from this, it is unsatisfactory. It is neither strong nor durable, and deteriorates rapidly from effects of light, air, and moisture. Thus it is suitable for use only where cheapness is of greater importance than durability: for cotton or wool baling, or for sacks to contain coffee, wheat, or corn. It is also used for cheap cordage, as the fabric base for linoleum, and for upholstery. It takes dye easily, and its attractive appearance gives it a further use as tapestry, very cheap dress goods, or an adulterant with better fibers. The natives use the leaves and shoots for food — for which purpose, indeed, the plant is principally cultivated.

Jute was first exported to England in 1828, a shipment of eighteen tons. When Dundee lost to Russia her position in flax-growing, she turned to jute manufacture, and became the chief center of the industry. Thus the United States used to import burlaps from Great Britain. The industry has shifted to India, however, so that we now obtain over 90% of our jute bags and burlaps directly.

Goatskins we use mainly for shoe uppers — glacé kid, the leather dressed on the hair side, suéde, dressed on the inner side. Recently we have been using them for gloves, but nine tenths of the gloves of domestic make are really of sheep and lamb skins. The genuine kid glove, which is far more durable than the others, we import chiefly from France. The Indian goatskin "patnas" from the district of Behar has been reputed the best in the world for the rare combination of fine grain and stout substance; but the best Brazilian and Mexican skins are said to be as good. About 40% of our imports (and our total supply comes from abroad) we receive from India.

Shellac, or rather, "lac," is a resinous exudation of certain insects that attack several species of trees growing in India. The insect itself and the twig of the "host" tree become encrusted with this resin or "sticklac." This is gathered, ground, sifted, melted, and purified in boiling water. Then it is fused in long, narrow bags by twisting it before an open fire, squeezed through the meshes on to porcelain cylinders, and left to cool in sheets or "shells." For use it is dissolved in alcohol, and applied as varnish for finishing woodwork, for hats, for phonograph records, insulation for electrical apparatus, for munitions, as paper size, etc.

The cultivation of lac is one of the oldest of the minor industries in India. Until the 16th century, however, the commercial product was not the resin or varnish, but some red coloring matter or dye contained in the body of the insect itself (whence the name of the color "crimson lake"). But methods have remained unchanged since the beginning of the industry. It is still in the hands of village laborers, poor, unskilled, and ignorant. They are careless in the selection of brood trees and of brood lac. They neglect the trees when prices are low, and strip them, even of brood lac, when prices are high. Manufacture is crude and adulteration is customary.

Our requirements of all three commodities, jute, goatskins, and shellac, are very irregular, and indicate no great tendency toward increase. Our total imports of jute and jute manufactures amounted to 596 million pounds per annum during 1909/11, and 696 million pounds per annum during 1919/21. Our imports of goatskins from India were 44 million pounds per annum during the first triennium, and only 36 million pounds for 1919/21. Shellac increased from 21 million pounds to 27 million. India has a monopoly of the world's production of jute and of shellac, and in value jute and goatskins are among our foremost imports, yet obviously not one of these can be called a necessity. India, as a source of materials, is not of vital importance to our industrial prosperity. Our interest lies more in the opportunity for the sale of American products. Our purchases of her materials have significance as affording the basis for an exchange.

As a Market for American Manufactures

As a market, India again presents sharp contrasts. She has enormous wealth, but it is concentrated in the hands of a very few. The Indian prince has his treasure vaults, where you can "plunge your arm to the shoulder in great silver caskets filled with diamonds, pearls, emeralds, and rubies"; where the walls are "studded with hooks, and on each pair of hooks rest gold bars three or four feet long and two inches across." But the populace is poverty stricken. The millions of people do not guarantee a proportionate market. China's millions are poor, but they are at least hard working and thrifty, and give promise of a great future.

India has industries. Her textile factories already produce more cotton piece goods than are imported. (Imports in 1920 were 1491 million yards; production, 1581 million yards.) The Tata Iron and Steel Works in 1917 and 1918 extended its plant, raising its output to over 120,000 tons and its prospective capacity to 425,000 tons of finished steel.

British capital investments throughout the country, however, insure the market for industrial equipment to the British manufacturer.

Hitherto the United Kingdom has supplied the greater proportion of India's imports — 63% in 1909/13. During the War, Great Britain lost a considerable share of her trade to Japan and the United States. India's purchases from the United Kingdom fell to 45.5% in 1918/19, while imports from Japan rose from 2% to 20%, and from the United States, from 3% to 12%. By 1920, however, Great Britain had practically recovered the ground she had lost (61%) — chiefly at the expense of Japan, whose trade had declined to 8%. During the War, also, foreign exporters began to deal directly with the Indian bazaars, but the heavy losses sustained by wholesale repudiation of debts during the depression of 1920/21 has done much to discourage the tendency toward direct relations.

Nevertheless, our best prospects for the future in this market, some writers think, lie, not of course in any great increase in India's purchasing power or in the total volume of her trade, but in a change in the direction of her purchases arising from the adverse political relations between India and Great Britain and the possible exclusion of British products.

The avowed policy of Great Britain toward India has been "the gradual development of self-governing institutions with a view to the progressive realization of responsible government in India as an integral part of the British Empire." Unfortunately England's efforts for the improvement of India have been little appreciated by the natives. Western civilization, as we have seen, rudely transgresses religious laws at every turn. The abolition of such revered customs as "suttee," the burning of widows alive with their deceased husbands, and self-martyrdom under the wheels of the Juggernaut, has been accepted with bitter resentment. The terrible mutiny of 1856, which ended the 280 years' rule of the East India Company, was a rebellion of discontented soldiery who had become persuaded that the British had ceased to regard Indian religious customs and ideas. An ignorant and irritated populace is easily stirred up by agitators, who tell them that famines are worse and more frequent under British rule than before, that the wealth and resources of the country are being exploited for foreign interests, and so on. Memories of the famines and of the oppression of native princes previous to British control grow dim and a longing to return to the "golden age" of the past is becoming more and more widespread.

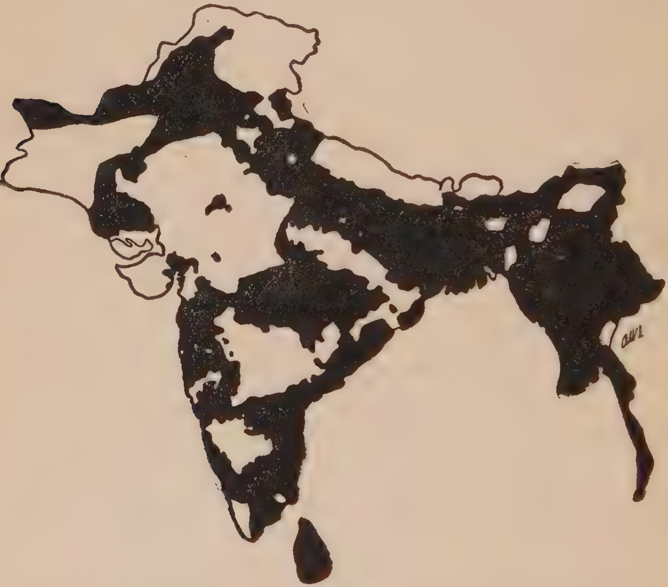

Fig. 69. India.
(Showing British possessions, black, and native states, white.)

This situation is being aggravated by the fruits of education. Since Hindu society is rigidly divided into occupational castes, the native clerical and professional classes, to whom the country must look for guidance, have confined themselves to a purely intellectual education, theoretical rather than practical. Radicalism in any country draws much of its fervor from young students, who are quick enough to perceive the maladjustments of social organism — as, indeed, who cannot! — but who fail to appreciate the difficulties in the way of a practical solution. In India, the danger has been much enhanced by the sudden uprooting of Eastern notions in the mind of the students, especially those educated in Western countries, and the necessarily superficial comprehension of Western ideas.

Unrest in India has been fanned by the activities and propaganda of the Bolshevists. India, lying on the southern border of Siberia, is the Achilles' heel of the British Empire. This explains in great measure the celerity with which Great Britain was ready to enter into relations with Bolshevist Russia, and the terms of the agreement by which the Soviets promised (!) to keep out of India. The muddle in Near Eastern politics has not strengthened the position of the British in India. Strong feeling was aroused there among the Mohammedans, who are interested in the preservation of the Turkish Empire and of the sovereignty of the Sultan as Khalif, by the attempted exclusion of the Turk from Europe. Finally, the failure of British policy in Western Europe has not been without serious effect in lowering British prestige in the East.

Radicals in India, of course, preach sedition, but the moderates, such as Ghandi, urge passive opposition, non-coöperation: the resignation by Indians of government titles and positions, withdrawal from schools — measures appealing particularly to Eastern asceticism — the "swadeshi" movement ("patronize your home industries"), in every branch of trade and economic life; and finally, the purchase of commodities from Great Britain's competitors, the United States and Japan, rather than from the British producer.

The objective of both radicals and moderates, however, is the same, India's independence. Already Great Britain has gone very far to meet India's demands. In 1919 (effective, 1921) she transferred to native control local government, public health, education, public works, and agricultural and industrial promotion. India has become practically her own mistress, even in regard to fiscal matters, except where her measures directly injure the vital interests of the Empire.

But exactly how far India's independence may benefit American trade is not at all certain. With any form of government, India would have to undergo an inner reconstruction, far more drastic than anything she has yet experienced, in order to hold her own among the nations of the modern world. Under British rule the low has found equal protection with the high; this caste or that has made no difference in the eye of the law; the farmer has been assured the fruits of his labor, the better man, the reward of his effort. It is altogether doubtful, however, whether India has reached a stage of development to fit her for self-government. We are always prone to sympathize with anything ticketed "independence" or "liberty," without regard to the fact that true freedom is contingent upon ability to maintain it. Form of government adapts itself to the character and enlightenment of the governed. "Democracy" may be the worst kind of tyranny, if the people allow themselves to be boss ridden. The great mass of Indians are absolutely ignorant and devoid of the least vestige of political interest or ambition. Their discontent is a matter of religion rather than politics. Although we feel ourselves more nearly akin to the East Indian than to the Chinese and Japanese on account of our racial affinity through the Aryan stock, as a matter of fact India has fallen closer to barbarism than any people that makes a pretense to civilization. "Independence" in India will mean freedom to return to tyranny and barbarism, to lose all the advance made under British tutelage.

If India returns to barbarism, we can hardly expect to find in her an appreciable market for our manufactures. If, the experiment in self-government proving premature, British rule recovers its control, India will, of course, be administered with one eye at least upon British home interests. An Imperial preferential tariff will discourage imports of American manufactures. If the concessions granted by Great Britain are found satisfactory, trade will naturally return to its earlier channels on account of British control over the machinery of commerce. In any case, the advantage of our exporting interests will probably be only temporary. The American trader who wishes to build up a permanent market for his commodities will do well to proceed with caution in India.

CHAPTER XV

AUSTRALASIA

Australia is of chief importance as a market. The people are in character similar to ourselves, and, being concentrated in the cities, are easily reached. Possibilities for expansion are great, but her development is hindered by socialistic legislation, which tends to discourage farming and over-stimulates industry. Her products, moreover, like Argentina's, are of secondary importance to us. New Zealand, unhampered by labor control, is making great progress in agriculture, but her products are the same as those of Australia.

Australia as a Market for American Manufactures

To most of us "Australia" immediately suggests *wool.* She is, indeed, the great wool country of the world, having together with New Zealand a sixth of the world's sheep.

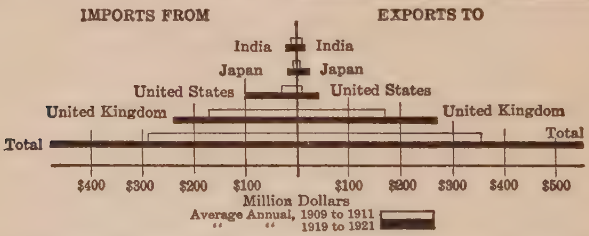

FIG. 70. Foreign Trade of Australia, Average Annual, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

On the other hand, we hear little of Australia's importance as a market. It may be something of a surprise, therefore, to learn that to the United States, Australia and New Zealand are really twice as important as markets for our products than as sources of supply of materials. Our exports to Australasia are regularly more than double our imports (including our purchases of wool indirectly via Great Britain). Our interest in the resources and future development of this region is derived from their bearing upon purchasing power and the probable direction of trade.

When trading with Australia, we are doing business with a people not merely of the same language as ourselves, but of our own temperament, customs and traditions, standards of living and outlook upon life. During the War our soldiers fraternized more agreeably with the "Anzacs" than with the British, and the Anzacs themselves found more in common with Americans and Canadians than with their first cousins and blood relations of the mother country. Racially they are a remarkably homogeneous people, practically all of Anglo-Saxon origin. Immigrants of the colored races are rigidly excluded, and the aborigines are now virtually extinct, numbering only a few thousands.

In approaching this market, no extensive educational campaign is necessary, as in South and Central American countries, or in China and India, to create an appreciation and understanding of the use of modern tools or articles of consumption. We find an alert and intelligent market. The Australian is able to discriminate, and knows what he wants. Isolated as the country is, every one reads the current periodicals and carefully scans the advertisements. Methods and equipment are of the latest. Sheep shearing, for instance, is done by electricity, milking machines are used on dairy farms, harvesters and other large-scale machinery in the wheat fields are much the same as our own Western farm equipment. The sales campaign in Australia, as in the United States, is purely a matter of advertising, suitable credits, and fair prices.

Although the total population of the country is only two thirds that of Argentina (5.5 millions), giving for her three million square miles an average density of 1.85 persons per square mile, two thirds are concentrated in the southeast corner, in the states of Victoria and New South Wales, comprising an eighth of the total area. As in Argentina, the inhabitants are urban dwellers: 62% live in cities and towns; 43% are in the six state capitals; 30% live in Sydney and Melbourne alone. Such concentration makes the sales campaign easy.

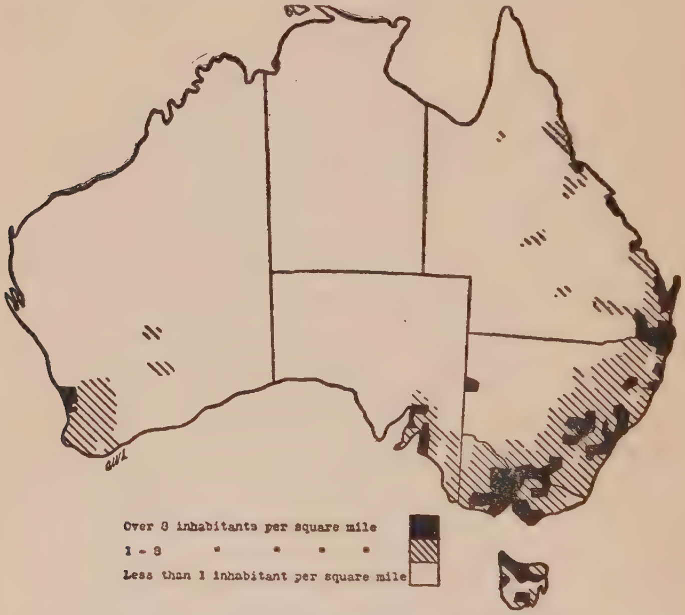
Over 8 inhabitants per square mile ■
1 - 8 . . . . ▨
Less than 1 inhabitant per square mile □

FIG. 71. Distribution of Population in Australia.

Possibilities for Expansion

Possibilities for future expansion are very great. The people are energetic and progressive. The absence of social barriers encourages ambition, and the climate stimulates activity. In the inhabited regions the temperature is much the same as in Buenos Aires, ranging from 50° F. in winter to 70° F. in summer (compare Argentina, 52° and 73°), with 27° the lowest on record and 111° the highest. The rainfall is 26 inches in Melbourne and 48 inches in Sydney (compare Argentina, 37 inches). Only about a third of Australia, however, enjoys an annual rainfall of 20 inches or more, and the danger of drought is serious. In the interior, the climate is hot, 100° for weeks at a time, but the dryness makes it not injurious for whites, and the winters on the inland plains are like those of Egypt, bright, clear, and warm by day, cold and frosty by night.

Some idea of the healthiness of the climate is suggested by the fecundity of animals. After the disastrous drought in 1903, which reduced herds of cattle and flocks of sheep by 25 to 30%, recovery was almost immediate. It is said that a really good lambing will give the squatter a 50% increase of his flock. Foxes in Australia double their normal fecundity, and of course there is the historic instance of the rabbit, which, free from natural enemies, multiplied until it became like a destroying army, leaving behind a bare, dusty plain where once was green pasture land. (Even so, it is difficult to credit the assertion of Mr. Frank Fox, that a single pair of rabbits, starting three months after birth, produce a litter of nine or ten young every month! At this rate, their progeny would number by the end of the year no less than 1500; at the end of the second year, well over a million!) The fight against the devastating rabbit has indeed been a life and death struggle, but today the scourge is in hand and rabbit skins form an appreciable item of export — over 10% of our purchases from Australia.

In Western Australia an enormous area of excellent pastoral country awaits the pioneer. This region is a fortnight or so nearer the European market than the southeastern seaboard. Irrigation will throw open thousands of square miles of fertile soil that only needs more water to make it return heavy crops. In the southeastern region upwards of 5000 artesian wells have already been drilled and projects are being promoted for impounding water in huge reservoirs. The Murrumbidgee irrigation scheme contemplates the storage of 33.6 billion cubic feet of water in a reservoir covering 12,740 acres. A dam 240 feet high is to be built below the confluence of two rivers which drain an area of 5000 square miles. Water will be supplied to some 200,000 acres of land for fruits and vegetables, dairying and stock raising, etc. Further areas are to be thrown open for settlement as similar works are completed.

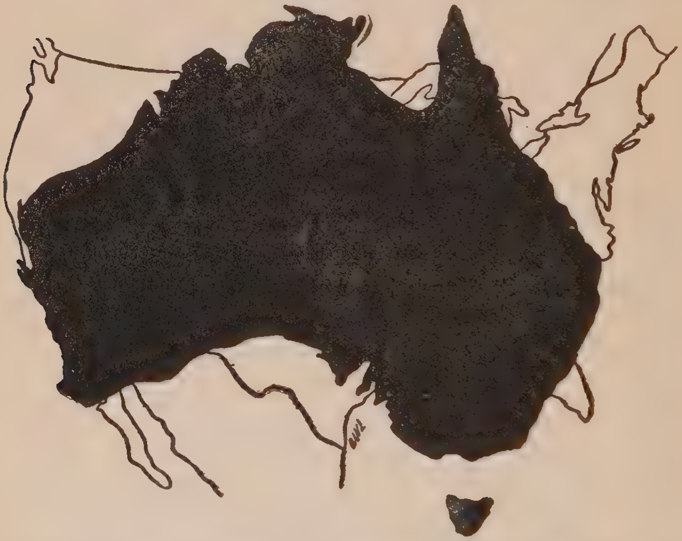

Fig. 72. Area of Australia. (Compared with the United States.)

Unlike Argentina, Australia's future does not depend upon agriculture and stock raising entirely. Her industrial mineral resources are readily accessible and give promise for the development of her industries. Her remote geographic position, moreover, will encourage progress in this direction. In coal Australia stands among the nations of second magnitude, with reserves of over 165 billion tons. The beds are located chiefly in Queensland and New South Wales, near what will become the centers of industry. In New South Wales, the coal is serviceable for bunkering and export. Some mines are being worked under Sydney harbor. There are important deposits of iron not yet exploited, and also of copper. Some tin is mined. For many years Australia rivaled the United States in gold production, but since 1903 has suffered decline.

Prospects of Future Development

Such are Australia's possibilities. But unfortunately her development is hampered by her own government policies. Although the oldest continent geologically, Australia has been settled, one might say, only during the past fifty years. The population of the entire commonwealth in 1875 was little more than that of our New England states in 1790. Religious and political freedom had already been achieved in Great Britain, so that Australia received settlers, not only imbued with ideas of liberty and equality, but already with some practical experience in self-government. Socialism in Australia has been able to proceed by natural development rather than by upheaval and radical destruction of old forms and traditions. Social stratification is non-existent, but this has not been an achieved state and therefore is not consciously paraded with that rudeness and insolence which our uneducated masses consider an essential sign of equality and independence.

Australia's socialistic legislation has attracted interest throughout the world. The educational system is a matter of pride with her as with us, although a somewhat smaller proportion of her children attend school. Her industrial legislation, the minimum wage law, eight-hour day, old-age pension system, compulsory arbitration, the maternity allowance of $25 per birth, etc., aim to benefit the working classes. Land tenures are so framed as to encourage the small farmer. No real poverty is to be found. The labor party — and labor is very closely unionized — practically directs federal politics. Although so far no attempt has been made to abuse the power by direct confiscation, all public service enterprises, including railways, are under government ownership. Australia is probably the most *practically* socialistic country in the world.

But whatever may be the beneficial results of her socialistic experiments, they have a decided tendency to prevent expansion. Legislation favoring the workman has rendered industrial occupation so attractive that the incentive for farming has been much reduced. The government has appreciated this situation and endeavored to stimulate rural settlement by land laws favoring small holdings, so that now 35% of the farm properties are less than 50 acres, almost 50% under 100 acres. Close settlement and intensive agriculture, however, are appropriate to large populations and plentiful rainfall. Extensive agriculture and large holdings are appropriate where the climate is dry and vegetation sparse, as we have noted in connection with a similar situation in Mexico. Where land is cheap, moreover, it is more economical to grow a thin crop with low yield per acre over a large area than a full crop in a carefully tilled inclosure. Similarly, the great government irrigation projects, implying intensive culture, cannot be expected to prove profitable for many years to come. The modest silo for storing a supply of green fodder in case of drought, used in conjunction with large-scale stock raising, is better adapted to Australia's present needs than costly irrigation enterprises.

Meanwhile, experimentation in settlement legislation has resulted in uncertainty of tenure and reluctance to develop properties. In all the states, acts have been passed authorizing the governments to repurchase lands already granted to private individuals for the purpose of cutting them into blocks "of suitable size" and throwing them open for settlement. Lands may be acquired by voluntary sale or by compulsion (except in South and Western Australia). Nearly four million acres of private lands have been so acquired. The uncertainty of land ownership thus created is said to be a worse risk than the droughts or the rabbits. Land has become attractive simply as a speculation, to purchase and hold long enough to sell with a profit on some fluctuation of value, but not for permanent development — upon which the future welfare of the country must depend.

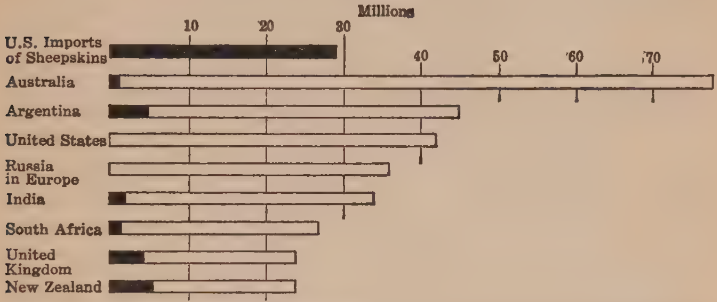

FIG. 73. Sheep Raising Countries of the World, and United States Imports of Sheepskins.

(Showing the number of head in each country, and in black, the number of sheepskins imported into the United States from that country, average annual, 1919/21.)

Whether this speculative element is the cause, or the ignorance of the small owner, or the economic maladjustment of small holdings to climatic and physical conditions of the country, stock raising seems to be on the decline. The break-up of large estates results in the dispersal of the flocks and the herds. One serious danger signal is the decrease in stud breeding. It is from the pure studs that drafts must be continually drawn to maintain the quality of the live stock, the wool and the meat, and to increase the export trade.

An important contributing factor in Australia's economic decline, also resulting from her socialistic experiment, has been her railway situation. In a mature, well-developed country government ownership of railways may prove advantageous. It is not so successful where railway construction must precede settlement. Theoretically the government should be an ideal agent, for it has at its command the available capital of the entire country and can wait a very long time for returns to its investment. But the government is controlled by the taxpayers, and they are not willing to be heavily mulcted for an improvement to benefit some remote, uninhabited frontier region, the advantage of which may not accrue in their lifetime. Railway construction under government ownership is not undertaken unless there are already enough votes along the proposed line.

Not only is Australia's railway construction impeded, but the upkeep and improvement of the roads already in operation are neglected. The inadequacy of equipment to handle live stock shipped to the seaboard, lack of refrigerator cars for transport of perishable produce, the scant attention and care paid to the animals in transit from their fattening grounds to the meat works, and consequent depreciation from hunger and thirst, etc., are discouragements enough in themselves to check rural development. Where Brazil offers free transportation for sires and seed, Australia charges more, sometimes ten times the ordinary rate, for carrying stud stock!

Other discouragements attend the farmer. More and more the burden of taxation is being shifted to his shoulders. In certain specific cases, two thirds of his income is taken in taxes. He has to employ labor that is strongly unionized. Sheep shearers are the aristocrats of agricultural labor. Independent, absolutely indispensable in the industry, powerfully organized, they command princely wages, and have it in their power to inflict instant and terrible loss upon the pastoralist — and they know it.

While Australia has imposed an increasing burden upon her farmers, she has been pampering her industries. There is much to be said in favor of developing industry in an agricultural country to make it economically independent, but for Australia the argument loses some weight on account of her geographic location. Equidistant from the manufacturing centers of Europe and America, and relatively close to Japan, she runs slight danger of being cut off from sources of supply. She is in a favorable competitive position as a buyer. Her remoteness may be a reason for establishing her independence, but her isolation itself is in a sufficient stimulus for the development of domestic industries without the grant of any additional bonus. Efforts to foster her industries in the face of a narrow home market and no foreign market — for it will be long before Australia can hope to export manufactures in competition with the older nations — are uneconomic. She is a frontier country, with a vast expanse of unoccupied land waiting to be exploited. From the economic standpoint, her best interests lie in the direction of rural development, exchanging her pastoral and agricultural products, which she can produce relatively cheaply, for manufactures, in which the older countries have the advantage.

At present, to judge by the character of her products Australia is still essentially agricultural. Farm products amounted in 1920 to £260 million in comparison with manufactures, £110 million.* The wool clip alone for the season of 1919/20 was worth in value over 315 tons of gold. In the United States, according to the last census, 1919, our agricultural products were valued at $21.5 billions and manufactures at $25 billions.* Nevertheless, the number of persons employed in industry in Australia is proportionately the the same as in the United States, about 7% of the total population. The value added by manufacture per employee, it may be observed, is very much lower in Australia than in the United States.

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* Value added by manufacture, *i.e.*, value of product minus cost of materials.

Whether the following statistics indicate the effect of Australia's policy or merely reflect war conditions cannot, of course, be determined but they will be valuable for comparison with similar figures in the future.

Statistics of Australia's Production

(In millions, except per capita figures.)

	1901	1911	1919	1920
Sheep				
number	72	93	76	73
per cap.	18.8	20.3	14	13.5
Cattle				
number	8.5	11.8	12.7	13.2
per cap.	1.96	2.58	2.40	2.44
Wool (lbs.)	543	726	663	
Butter (lbs.)	102	212	166	
Wheat				
acreage	5.1	7.4	6.4	
crop (bu.)	38.6	71.6	46.0	
Corn				
acreage	.29	.34	.27	
crop (bu.)	7.0	8.9	6.8	
Coal (tons)	6.88	10.4	10.57	
Copper (lbs.)	95. (08)	88.	53.	38.
Gold (£)	£14.00	£10.55	£5.45	£5.50

Commodities for Exchange

While the prospects of Australia's speedy development are somewhat modified by the effects of her form of government, the future of American trade with her is still further clouded by the character of the products she offers for exchange. She is strikingly similar to Argentina. Clothing wool, wheat, meat, and dairy products are her major exports, amounting together to 70% of the total. Hides and skins are about 3 or 4%. Our chief interest is in wool, which forms

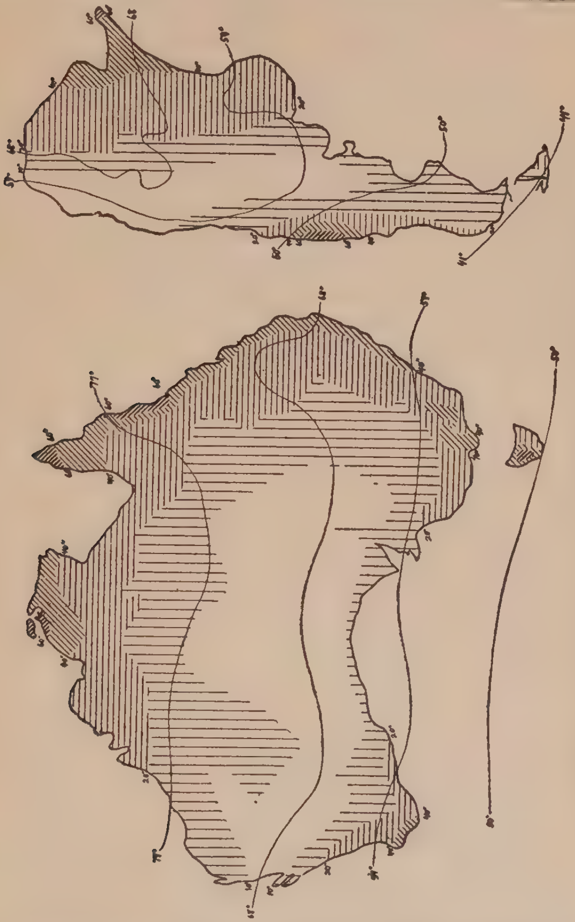

FIG. 74. Similarity of the Climates of Australia and Argentina. (Showing isotherms and number of inches of rainfall.)

43% of our imports from Australia. Furs are 12%, and hides and skins, 8.5%.

The increase in our requirements of foreign wool, as we pointed out in the chapter on Argentina, is determined by our population increase and the gradual crowding out of sheep raising on our farms. But Australia is 10,000 miles distant — over half as far again as Punta Arenas, the coming wool port of South America. As Australia is about equally distant from New York via the Suez Canal as via the Panama, the advantages of buying in the great wool market at Liverpool may well offset any gain from direct purchase. Financing of trade through Great Britain, as we have pointed out elsewhere, tends to result, not so much in "three cornered trade," as is popularly supposed, but in what we might call "two sided" exchange. Great Britain purchases wool from Australia and pays with her manufactures; we buy wool from Great Britain and pay her with our food and raw materials. As we find ourselves less able to spare these commodities, our purchases of Australian wool may decline in favor of Argentine wool. This will be the more likely, since Great Britain, with her extensive export market for wool textiles, will continue to be an advantageous market for Australia, favored, also, by political ties.

That these factors may already be in operation would seem to be indicated by the change in the sources of our wool imports during the last decade. In 1909/11 we purchased, both directly from Oceania and indirectly by way of Great Britain, about 35% of our clothing wool, 26% from Argentina, and 4.3% from Uruguay. In 1919/21, our purchases from Oceania had dropped to 21%, and those from Argentina increased to 35%, and from Uruguay, to 14.5%. We also get now 5% from Chile and 10% from British South Africa, which is just about as far away as Punta Areas.

With regard to Australia's other major exports, wheat, meat, and dairy products, we have even less interest than in the case of Argentina. It might be supposed, to look at the map, that Australia would offer great opportunities as a source of tropical commodities. Two fifths of her area lie north of the Tropic of Capricorn. Conditions, however, seem unsuitable for the most important products. Cotton, coffee, and sisal, it is said, can be grown in Queensland, but the results have been unsatisfactory. Moreover, Australia's policy of excluding the colored races, and the exorbitant wages demanded by Australian workmen, make the labor problem an insuperable difficulty. The coconut products we obtain from Australia are reëxports brought from the adjacent islands of the Pacific. Sugar growing, which seems to have been successfully introduced in Queensland in spite of the government prohibition of the use of "kanaka" labor, and which actually reached nearly three million tons of cane, yielding 328,000 tons of sugar in 1917, has been maintained solely by bounties and governmental price regulation.

In short, we must conclude that, while Australia offers many advantages as a market for American products — the same language, customs, standard of living, the people energetic and enterprising — her economic progress is being deterred by legislation ill adapted to her particular situation, and the commodities which she has to offer in exchange are not those that we require most or for which our demand is likely to increase rapidly.

NEW ZEALAND

The Stockholder's Paradise

In New Zealand, the disadvantages arising from control exerted over the government by industrial labor do not exist. The farmers are strong and the workers' unions relatively weak. Industry is confined to meat refrigeration, butter and cheese manufacture, and such agricultural industries. The dominant interest of the government thus coincides with the true interest of the country. The spirit of enterprise is not discouraged by unnecessary or unequal burdens.

The country is called the "stockholder's paradise." It enjoys the healthiest of climates, the richest pastures, absence of stock diseases. Two thirds of its area of 103,581 square miles are suitable for agriculture and grazing; 25% is forested. New Zealand has three million head of cattle, which is more per capita than Australia, and represents an increase during the decade of 65%. Her sheep, 23.3 million head, number 18 per capita, as compared with Australia's 14 per capita.

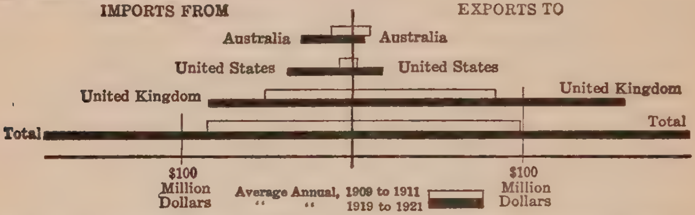

Fig. 75. Foreign Trade of New Zealand, Annual Average, 1909/11 and 1919/21.
(Showing imports and exports, and major countries.)

With a population of only 1.22 millions, her total trade, $375 million per annum during 1919/21, gives a per capita exceeded by that of few other countries. Her imports averaged $180 million, her exports $195 million. Half of the imports in 1920 came from Great Britain, and a sixth, probably indirect shipments from England, from Australia. The United States supplied 18%.

New Zealand's exports, however, are the same as Australia's: wool (25%), meat (25%), butter and cheese (20%), and hides and skins (9%). She is 1200 miles nearer the United States, but our purchases will doubtless always remain less than Great Britain's. We shall have the same disadvantage as in Australia when selling in this market, owing to the adverse exchange.

SOURCES OF INFORMATION

To the works consulted in the preparation of this book — a list necessarily very far from exhaustive — have been added in italics further references to sources of information for supplementary material. To make a study of Colombia (not included in this book), the student, besides consulting the general sources listed below — the encyclopedia, Statesman's Yearbook, etc. — can find the names of recent books relating more exclusively to his subject in the United States Catalog of Books Published, newspaper items in the New York *Times* Index, names of consular officials in the Congressional Directory, etc. If he wishes to obtain technical information on cotton or wheat, he can select the appropriate trade organization to approach from the United States Department of Commerce list of Commercial and Industrial Organizations. Some of the larger manufacturing concerns have publicity departments, and are glad to answer seriously intended inquiries. Names and addresses of manufacturers are given in Thomas's Directory, and in the Wilson catalogue of books published in the United States may be found a list of special trade directories . . . and so on.

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INDEX

(Pronunciations from Webster's New International Dictionary.)

Abaca, Manila hemp, 354.

Adaptation of industry to natural environment: American, 48; British cotton textiles, 50; French, 96 f.

Agrarian movement, in England, 33; in France, 95.

Agricultural equipment, market for, in Argentina, 132; in Australia, 379; in Brazil, 174; in Santo Domingo, 238.

Agricultural methods in India, obstacles to improvement, 366.

Agricultural regions, in Argentina, 114; Australia, 381; Brazil, 138, 156, 160, 162; Central America, 243; Chile, 205, fig. 32, 185; China, 288 f.; France, 102; Germany, 79; India, 365; Mexico, 261; Santo Domingo, 237.

Agricultural resources, *see* Agricultural regions.

Agriculture:

- Area of arable land, in Chile, 204, fig. 35, 204; Cuba, 237; Great Britain, 315; Japan, 314; New Zealand, 392; Santo Domingo, 237.
- Area under cultivation in Chile, 206, fig. 35, 204.
- Crop rotation in China, 282.
- Expansion, room for, in Argentina, 118; in Chile, 206, fig. 35, 204; China, 295; Cuba, 229; Haiti (Island of), 237; Mexico, 261.
- Fertilizers used, in China, 283; France, 102; Germany, 79, 102.
- Land holdings, size of, in Argentina, 121; Australia, 384; Chile, 206; Cuba, 240; France, 95; Great Britain, 315; India, 366; Japan, 315; Mexico, 277; Porto Rico, 240.
- Land holdings, size in relation to climate, 277, 384.
- Population engaged in, proportion, in France, 5, 94; Germany, 5, 94; Great Britain, 94, 314; India, 361; Japan, 314; United States, 94.
- Production, *see* Production, specific commodities.
- Resources, *see* Agricultural regions, Production.
- Tropical, risks of, 247.
- Yield, *see* Production, and Yield, specific commodities.

Alfalfa, 160.

Almagro, 185.

Alsace:

- Cotton textile industry, number of looms and spindles in 1870, 77; in 1920, 103.
- Potash deposits, 81, 102.
- Wool textile industry in 1920, number of spindles, 103.

Alsace-Lorraine, acquisition by Germany, 77.

Amazon region, 144, 149, 160.

Amazon rubber, 142 f.

American capital investments

abroad, *see* Capital investment, American.
American capitalistic enterprise in the banana industry, 47; in Cuban sugar production, 226.
Anhwei (än′hwā′), Province of, description, products, 290.
Aniline dyes, 80 f.
Antimony, production of China, proportion of world's output, 296.
Antofagasta (än′tô fä gäs′tä), nitrate province of Chile, 187.
Area:
  Argentina, 216, compared with Brazil, fig. 28, 159; compared with the United States, fig. 18, 125.
  Australia, 379, compared with the United States, fig. 72, 382.
  Borneo, 343.
  Brazil, compared with the United States, fig. 29, 167.
  British Empire, 42.
  British Isles, compared with Europe and other European nations, fig. 7, 15; compared with Japan, fig. 56, 312; Malaysia, fig. 58, 340; Texas, fig. 10, 42; the United States, fig. 7, 15.
  Central America, compared with Texas, fig. 42, 243; Central America and independent West Indian Islands, 216.
  Ceylon, 343.
  Chengtu Plateau, 291.
  Chile, 204; compared with the United States, fig. 36, 205.
  China, 286; compared with the United States, fig. 52, 294.
  Cuba, 220; compared with Texas, fig. 37, 217.
  Dutch East Indies, 343; proportion of total of Malaysia, 343.
  Europe, compared with the United States, fig. 7, 15.
  Federated Malay States, 343.
  Finland, compared with Europe and other European nations, and with the United States, fig. 7, 15.
  France, compared with Europe and other European nations, and with the United States, fig. 7, 15.
  French Colonial Possessions, 112.
  Germany, compared with Europe and other European nations, and with the United States, fig. 7, 15; with Texas, fig. 12, 84.
  Great Britain, *see* British Isles.
  Haiti, Republic of, 233.
  Hokkaido, 312.
  Honshiu, 311.
  India, 361; compared with the United States, fig. 64, 360.
  Japan, 311; compared with the British Isles, fig. 56, 312.
  Japanese Empire, 311; compared with the British Isles, fig. 56, 312.
  Java, 343.
  Malaysia, 343; compared with the United States, fig. 59, 342.
  Matto Grosso, 159.
  Mexico, 216, 261.
  New Zealand, 392.
  Nicaragua, 216.
  North Borneo and Sarawak, 343.
  Papua, British, 343.
  Philippines, 343.
  Porto Rico, 240.
  Protected Malay States, 343.
  Salvador, 216.
  Santo Domingo, 233.
  Sarawak and North Borneo, 343.
  Straits Settlements, 343.
  Texas (262,398 square miles).
  United States, 3.

AREA (*continued*)
  West Indian dependencies (in aggregate), 216.
ARGENTINA, 114 f., fig. **16**, 119.
  Agriculture: agricultural region, 114, comparative size, fig. **28**, 159; handicaps to expansion, 121; landholdings, size of, 121; natural resources, 114 f.; products, 118; proportion of tillable land under cultivation, 118.
  Area, compared with Brazil, fig. **28**, 159; compared with United States, fig. **18**, 125.
  Capital investments in, by France, Germany, Great Britain, United States, 124.
  Cattle: area required per head in cattle ranging, 242; number of head, 118, 203, fig. **19**, 128, compared with the United States, 125; per hundred persons, 203.
  Climate, 115; similarity to that of Australia, 381, fig. **74**, 389; to that of United States, fig. **18**, 125.
  Debt, foreign, per capita, 181.
  Drought in, 121.
  Exports: (value), fig. **17**, 123; to Brazil, France, Spain, United Kingdom, United States, fig. **17**, 123; proportion to United States, 124; commodities, 124; cattle hides, proportion to United States, 132; corn, 118; grain, proportion to Germany, to Great Britain, 131; meat, proportion to Europe, 131; wheat, 1920, 118; wool, proportion to United States, 132.
  Immigration, proportion to total population, 142.
  Imports: (value), fig. **17**, 123; from France, Brazil, Spain, United Kingdom, United States, fig. **17**, 123; proportion supplied by the United States, 123.
  Industries in, 122.
  Latifundia, 121.
  Live stock, 118.
  Locusts in, 121.
  Market for agricultural equipment, 132; for consumers' goods, 132; for manufactures, 123.
  Minerals, paucity of accessible reserves, 122.
  Political conditions before and during the early years of the republic, 120.
  Population, 120: concentration in cities, 120; density, average, 216; rate of increase, 168; rural population, 120, in Province of Buenos Aires, in Cordoba, 120.
  Products, 118; possible future requirements of the United States, 126 f.
  Provinces, fig. **16**, 119.
  Railways, 119.
  Rainfall, 381, fig. **74**, 389; compare that in Australia, fig. **74**, 389.
  Sheep, number of head, 118, 362, fig. **73**, 385; per square mile, relative to population, 203.
  Sheep raising, regions, 131.
  Trade, value, 218; *see* Imports and Exports.
  United States: exports to Argentina (value), 124, fig. **6**, 14; increase, 124; of manufactures, fig. **6**, 14; imports from Argentina (value), fig. **6**, 14; major commodities, 124; calfskins, cattle hides (pieces), fig. **19**, 128; sheepskins (pieces), fig. **73**, 385;

ARGENTINA (*continued*)
  wool, 130, proportion from, 390.
Arid regions, in Argentina, fig. **28**, 159, fig. **74**, 389; Australia, 381, fig. **74**, 389; Chile, 186, 204, fig. **32**, 185; China, fig. **49**, 283; Mexico, 261.
Arkwright, patented the "water frame," 29.
Artificial silk, 305.
Asbestos, extent of British commercial and political control over world's production, 44.
Assignats, 92.
Audit control, as a remedy for China's ills, 310.
Australasia:
  Sheep, proportion of world's, 43.
  Tea consumption per capita, 299.
  United States exports to; of manufactures; imports from, fig. **6**, 14; wool, proportion from, 390.
AUSTRALIA, 378 f.
  Area, 379; compared with the United States, fig. **72**, 382.
  Cattle, number of head; relative to population, 388.
  Climate, 381; compared with Argentina, 381, fig. **74**, 389.
  Distance from New York, U. S. A., 390.
  Drought in, 381.
  Education in, 383.
  Exports: (value), fig. **70**, 378; to India, Japan, United Kingdom, United States, fig. **70**, 378; major commodities, 389; furs, hides, and skins, wool, proportion of exports to United States, 389; rabbit skins, proportion of exports to United States, 381.
  Government encouragement to industry, 387; to small agricultural land holdings, 384.
  Government ownership of public service enterprises, 384; of railways, effects, 386.
  Imports: (value), fig. **70**, 378; from India, Japan, United Kingdom, United States, fig. **70**, 378.
  Indirect trade with United States, 390.
  Industrial legislation, 383.
  Industry, government encouragement of, 387.
  Irrigation in, 382.
  Land tenure, government encouragement of small holdings, 384.
  Manufactures, value of output, 387.
  Market, importance to the United States, 378, 391.
  Minerals in, 382.
  Murrumbidgee irrigation scheme, 382.
  Population, 379 f.: composition, homogeneity of; concentration in cities; density; distribution, fig. **71**, 380; proportion engaged in industry, 387.
  Production: butter, coal, copper, corn, gold, wheat, wool, 388; sugar, 391.
  Products, 388; for exchange with the United States, 389.
  Property ownership, uncertainty of, 385.
  Rabbits in, 381; exports of rabbit skins, proportion of total exports to United States, 381.
  Railways, effects of government ownership, 386.
  Rainfall, 381, fig. **74**, 389.
  Sheep, number of head, 362, 388, fig. **73**, 385; relative to population, 388, 392.

Australia (*continued*)
  Social stratification, absence of, 383.
  Socialism in, 383; an obstacle to agricultural expansion, 384.
  Standard of living, 383.
  Stock raising, area for expansion in Western Australia, 381; decline of, 385.
  Taxation of the farmer, 386.
  Trade, future of American, with, 390; indirect, with, 390.
  Tropical agriculture in, 391.
  United States: exports to Australia (value), fig. 6, 14; of manufactures, fig. 6, 14; imports from Australia (value), fig. 6, 14; of sheepskins (pieces), fig. 73, 385; of wool, proportion of United States imports from, 390.
Autocracy, advantages and disadvantages of, 83; in relation to Germany's ascendancy, 73 f.; in relation to Japan's progress, 319.
Automobiles, number relative to population, in Great Britain, in United States, 264.

Bahia (bä ē′ä), cocoa region, 153; death rate in, 177.
Baikal (bī käl′), lake in Siberia, 328.
Balance of trade: excess of exports explained, from Chile, 197; from the East Indies, 344; from United States to Argentina, 124, to Europe, 19, to Great Britain, 26.
Banana: description, processes of cultivation, harvesting, 244 f.
Banana industry: history; difficulties and risks: of tropical destruction, labor problem, political turmoil, sanitation, transportation; large scale enterprise in, 247 f.
Banka, tin in, 351.
Banks, dependence of American traders upon British, 19; factor of the Industrial Revolution, 34; in Germany, control of industry, promotion of foreign trade, supervision by government, 74; in Japan, assistance to industry under government direction, 320.
"Barilla," tin 60% pure metal, 352.
Barley:
  Production per 1000 persons in Belgium, Germany, Switzerland, United Kingdom, 86.
  Yield per acre, Germany, 79; Japan, United Kingdom, 315.
Basic process of steel manufacture, 78.
Basic slag, by-product of basic steel production; lime, phosphoric acid content; use for fertilizer, 78.
"Black Republic," 233.
Blast furnace, description, 191.
Beef, exports from Brazil in 1919, 161; relative food value per acre of land used, 127.
Beet sugar, *see* Sugar, beet.
Belgium:
  Capital investments in Brazil, 176.
  Dependence for iron, 85.
  Foodstuffs, imports per capita, 86.
  Live stock per 1000 persons: cattle, goats, sheep, swine, 86.
  Population density, 5.
  Production per 1000 persons: barley, oats, potatoes, rye, sugar beets, wheat, 86.
  United States exports to; of manufactures; imports from, fig. 6, 14.

Billiton, tin in, 351.
"Blister copper," 95% pure metal, 193.
Bolivia:
  Boundary disputes with Chile, 187.
  Tin, 352; production; United States imports, fig. 63, 351.
Bolshevism in India, 375.
Borax in Chile, 195.
Borneo (bôr′nĕ ŏ), area, 343; proportion of petroleum output of the Dutch East Indies, 357.
Bracuhy Falls of Brazil, potential waterpower, 173.
BRAZIL, 134, fig. 22, 138.
  Agriculture: natural resources, room for expansion, 137, 156, 160, 162; products, 134, 156 f.
  Area, compared with the United States, fig. 29, 167; Amazon region, 144; cattle-raising regions, 159; coffee-producing region, 138; timber lands (Parana pine), 158.
  Capital investment: American, Belgian, British, French, 176; European, 182; cotton textile manufacture, 175; manufactures, 174, 208; per capita, 208; opportunity for, 150, 156, 166, 172.
  Cattle raising, 158 f.
  Cattle hides, United States interest in, 161.
  Climate: Amazon region, 178; interior, 160, 178; suitable for cocoa growing, 153; for coffee growing, 139.
  Climatic complement of the United States, 135, fig. 20, 135.
  Cocoa: processes of cultivation and harvesting, production, room for expansion, United States imports, 151 f.
  Coffee: processes of cultivation and harvesting, room for expansion, statistics of exports, production, and United States imports, 136 f.
  Complement, natural, of United States, 135, fig. 20, 135.
  Cotton textile manufacture, capital investment in, 175.
  Currency of, 179.
  Debt, foreign, 181; per capita, 213; interest charge per capita, 181.
  Disease in, 177.
  Exports (value), fig. 31, 175; to Argentina, France, Germany, United Kingdom, United States, fig. 31, 175; proportion consigned to Great Britain, to United States, 176; major commodities, 134; beef, 161; proportion represented by coffee and rubber, 180.
  Financial situation, 179.
  Goatskins, 371.
  Government, form of, 182.
  Harbors, 171.
  Hydro-electric power, 173 f.
  Immigration, 141.
  Imports: 1913 and 1914, 180; annual average 1909–11 and 19 9–21, fig. 31, 175; from Argentina, France, Germany, United Kingdom, United States, fig. 31, 175; proportion supplied by Germany, by Great Britain, by the United States, 175.
  Indian population in, 168.
  Investments, *see* Brazil, Capital investment.
  Labor, lack of competent, in cocoa growing, 156; in coffee growing, 139; in rubber collecting, 144.

Brazil (*continued*)
  Manufactures in, 174.
  Market, for agricultural equipment, 174; consumers' goods, 170; electrical appliances, 174; producers' goods, 170.
  Mineral resources, 163.
  Negro population in, 167.
  Population: composition, number, 166; rate of increase, 168.
  Production: cocoa, fig. 26, 123; coffee, 137, fig. 21, 136; corn, 162; cotton, 162, fig. 65, 361; gold, 165; monazite, 164; rubber, fig. 61, 347; sugar, cane, 163, fig. 38, 221.
  Products, 134 f., 156 f., 163 f.
  Railroads: difficulties of construction; electrification; extent, 171 f.
  Revenue, proportion from import tariffs, 180.
  Rubber: collecting and preparation, labor problem, opportunity for capitalistic enterprise, 142 f.; production, United States imports, fig. 61, 347.
  São Paulo, coffee production, 138.
  Silk, climate suitable, 134.
  States of, fig. 22, 138.
  Tariff, policy, 174; proportion of revenue from, 180; reduction, on certain imports from the United States, 176.
  Timber resources, 158.
  Trade, foreign, fig. 31, 175; per capita, 218.
  United States: advantageous situation for trade, 176; exports to Brazil (value), fig. 6, 14; of manufactures, fig. 6, 14; imports from Brazil (value), fig. 6, 14; of cocoa, 156, fig. 26, 153; coffee, 137, fig. 21, 136; rubber, fig. 61, 347, proportion of total imports of rubber, 144; interest in Brazil, 183; in cattle hides, 162; in mineral deposits, 166.
  Waterpower, developed, potential, 173, 174.
  Wheat-growing regions, 162.
Breadstuffs, production per 1000 persons, in Belgium, Germany, Switzerland, United Kingdom, 86.
British commercial and political control over mineral production, 44; of tin smelting, 350.
British East Indies, fig. 58, 340.
  Exports to, and imports from, the United States, 344.
  Rubber production, United States imports, quantity, fig. 61, 347.
British Empire: area, climate, population, resources, 42 f.
British India, distinguished from native states, fig. 69, 374.
British industry, 46 f.; keystone of the Empire, 46.
British interests in the Caribbean region, 267.
British Isles, area, compared with East Indies, fig. 58, 340; with Europe and other European nations, fig. 7, 15; with Japan, fig. 56, 312; with Texas, fig. 10, 42; with the United States, fig. 7, 15.
British policy toward India, 373, 376; Near East, 375; Soviet Russia, 375.
British rule in India, advantages of, 376.
British South Africa, proportion of United States wool imports from, 390.
Brussels agreement, regarding sugar bounties, 223.
Buenos Aires (bwā′nōs ī′rās), capi-

tal and chief port of Argentina, 118.
Buenos Aires, Province of:
  Cattle raising in, 118; number of head, 159.
  Density of rural population, 120.
  Railroads, extent relative to area, 119, 171.
Bundesrath, 73.
Bunkering stations in the Caribbean, importance to United States, 266.
Butter and cheese, proportion of exports from New Zealand, 392; production of Australia, 388.
"By-product silver," 269.
By-products, of basic steel production, 78; of coke production, 80, 200; of oil shales, 200; of the sugar beet, 223; of sugar cane, 228; of nitrate production, 195.

Cacao, *see* Cocoa.
Cairo (kī'rō), death rate in, 178.
Calfskins, United States imports, fig. 19, 128.
Calcutta, death rate in, 178; distance from London, from Yokohama, 45.
Camaguey (kä'mä gwā'), Cuba, brown iron ore deposits in, 229.
Campine coal basin, 108.
Canada:
  Coal reserves, 63.
  United States: exports to Canada, fig. 6, 14, of manufactures, fig. 6, 14; imports from, fig. 6, 14; of calfskins, of cattle hides (pieces), fig. 19, 128; trade with, virtually an extension of domestic trade, 21.
Canals, in China, 284, 290; in India, acreage irrigated by, 365; failure of natives to utilize, 366.
Cane sugar, *see* Sugar, cane.
Canton (kăn tŏn'), 293.
Canton River (Si-Kiang or West River), 287.
Canton River Basin, description; provinces of, 293.
Canton River plain, 293.
Capital: a factor in the Industrial Revolution, 34; attitude of Mexican government toward, 269; supply of native, in China, 297.
Capital investment:
  American, in Argentine enterprise, 124; meat packing, proportion, 131; in Brazil, 176; in Chilean copper production, proportion, 194, iron mines, 195; in Mexico, 278, copper mining, 270, silver mines, 269.
  Belgian, in Brazil, 176.
  British, in Argentine enterprise, 124; railways, proportion, 124; in Brazil, 176; in Mexico, 278.
  European, in Brazil, 182.
  French, in Argentina, 124; in Brazil, 176; in Mexico, 278.
  German, in Argentina, 124; in Mexico, 278.
Capital investment, in
  Argentina, 124.
  Brazil's cotton textile industry, 175; manufactures, 174, 208, per capita, 175.
  Chile's manufactures, per capita, 208.
  China, obstacles to native investment, 297.
  United States manufactures, per capita, 175.

Capital investment, opportunity, in Brazil, 183; in Chile, 212; in China, 281, 307; in Dutch East Indies, 357; in Santo Domingo, 239.
Capital investment abroad, relation to foreign trade, 21 f.
Capitalistic enterprise:
  A possible stabilizing factor in Central America (?), 250.
  Advantages, in East Indian rubber growing, 349.
  In the banana industry, 247; in Cuban sugar production, 224 f.; in France, hindered by lack of coal resources, 99; in tropical agriculture, 247.
  Needed for agricultural development in Mexico, 262; for cocoa production in Brazil, 156; for exploitation of mineral resources of Mexico, 262; for rubber production in Brazil, 150.
  Political influence in Central America, 249.
  Repression in Mexico, 276.
Capitalistic production, reversion of British industry from, 51, 57; in cotton textile industry, 52; in wool textile industry, 55; effect upon iron and steel industry, 57.
Caribbean interests of Europe, 256; of the United States, 218, 256.
Caribbean region, population, trade, prosperity, etc., 215 f.
Cartwright, inventor of power loom, 30.
Caste system in India, 367.
Cattle:
  Major cattle-raising countries of the world, fig. 19, 128.
  Natural increase of herds in Argentina, 117.
  Number of head in Argentina, 118, 203, fig. 19, 128; Australia, 388, fig. 19, 128; Brazil, 158, fig. 19, 128; Buenos Aires, 159; Canada, fig. 19, 128; Chile, 203; China, fig. 19, 128; France, fig. 19, 128; Germany, fig. 19, 128; India, 362, fig. 19, 128; New Zealand, 392; Rio Grande do Sul, 159; Russia in Asia, fig. 19, 128; Russia in Europe, fig. 19, 128; United Kingdom, fig. 19, 128; United States, 362, fig. 19, 128, compared with Argentina, 125.
  Number per square mile in Chile, in Uruguay, 203; Rio Grande do Sul, 159.
  Number relative to population in Argentina, 203; Australia, 388; Buenos Aires, 159; Belgium, 86; Chile, 203; Germany, 86; Switzerland, 86; United Kingdom, 86; Uruguay, 203.
  Quality of stock in Brazil, 160.
  Proportion of world's stock in India, 43, 361, in the United States, 43.
  Regions in Brazil suitable for expansion, 159.
Cattle hides:
  Imports into the United States (pounds), 1900 to 1920, 129; (pieces), annual average 1919–21, fig. 19, 128; from Argentina, Canada, India, fig. 19, 128; value, fig. 8, 22.
  Increasing requirements of the United States, 128, 161.
  Proportion of Argentina's exports consigned to the United States, 132.
Cattle raising, stages in, 126.
Cattle ranging, area required per

  head in Argentina, in Guatemala, in United States, 242.
Ceara (sā′ä rä′), cotton growing state of Brazil, 162.
Celebes (sĕl′ē bēz), 342.
CENTRAL AMERICA, 242 f., fig. **42**, 243.
  Agricultural products, 243.
  American diplomacy toward, 256.
  American interests in, 256.
  American public opinion toward private enterprise in, 254.
  Area, compared with Texas, fig. **42**, 243.
  Aristocracy, interests of, 251.
  Banana: description, processes of cultivation and harvesting; industry: history of, risks, capitalistic enterprise, 244 f.
  Capitalistic enterprise, political influence exerted by, 249; a possible stabilizing factor, 250.
  Cattle ranging, area required per head, 242.
  Coffee, importance; proportion of total exports, 243; proportion of United States imports, 244.
  Federation of states, inherent instability, 251.
  Fertility of soil, 242.
  Intervention, problem of, 253.
  Mineral resources in, 243.
  Political instability, inherent in character of the people, 251.
  Population, concentration of, 243; density, 216.
  Railways, lack of, 249.
  Topography, fig. **43**, 252.
  Trade, per capita, 218.
  Transportation, 249.
Central region of China, description of, 290.
Central Valley of Santo Domingo, 238.
Centralized government, advantages and disadvantages, 73, 83, 319.
Cessions of territory by China to European nations, 325.
Ceylon (sē lŏn′): area, population, 343; rubber, acreage in, 348.
Chardonnet, Hilaire de, invented artificial silk, 306.
Chekiang (chŭ kyäng′), Province of, description, products, 292.
Chemical industry and war, 82.
Chemical industry of Germany, 80 f.; of Great Britain, in relation to France's requirements of coke, 109.
Chengtu Plateau (chŭng′tōō′), description, products, 291.
Chientao (chĭ ĕn tou′), 329.
Chihli (chē lē′), Province of, description, products, 288.
Chihuahua (chē wä′wä), mineral state in Mexico, 269.
CHILE, 184 f.
  Agricultural region, 205; area compared with the Province of Buenos Aires and Texas, fig. **35**, 204.
  Agriculture: labor, 206; land holdings, size of, 206; resources, 203; products, 203; room for expansion, 206, fig. **35**, 204.
  American capital in copper mining, 194; in iron mines, 195.
  Area, 204, compared with the United States, fig. **36**, 205; arable land, 204; actually under cultivation, 206; compared with the Province of Buenos Aires and Texas, fig. **35**, 204.
  Aristocracy, character, 196, 209.
  Boundary disputes with Bolivia, 187.
  Capital investment in: Ameri-

CHILE (*continued*)
can, control in copper mining, 194; in iron mines, 195; manufactures, 208, per capita, 208; opportunity for, 212 f.; profit of, 212; risk, due to fluctuating value of currency, 213.
Cattle, number of head; per square mile; relative to population, 203.
Climate, 204, 205.
Coal, quality, 209.
Coke, dependence for, 210.
Copper: extent and location of reserves; quality of ore; made commercially accessible through improvements in processes of concentration, smelting, and refining; production; United States imports, 187 f.
Currency, 213.
Debt, foreign; per capita; per capita interest and sinking fund charges upon, 213.
Electricity, project of longitudinal transmission system, 208; for copper refining, 193.
Establishment of republic, date, 212.
Exports, effect of Panama Canal upon, 185, 195, 210; (value), fig. 34, 196; to Argentina, France, Peru, United Kingdom, United States, fig. 34, 196.
Financial condition, 213.
Harbors, 198.
Hydro-electric power, actual development; potential, 208.
Immigration, 206, 209.
Imports, effect of Panama Canal upon, 210; (value), fig. 34, 196; from Argentina, France, Peru, United Kingdom, United States, fig. 34, 196.
Indian population in, 195.
Iron reserves; American interests in, 195.
Labor in, 209.
Land tenure, size of holdings, 206.
Latifundia in, 206.
Length, 204.
Lumber: consumption requirements, dependence upon imports, extent of commercial timberlands, proportion of forest growth suitable, 207.
Manufacturing, 207.
Market, for consumers' goods, 195; for producers' goods, 199.
Military strength, 212.
Minerals in, 185, 195.
Naval strength, 212.
Nitrates: extent and location of deposits; origin of; production, 186; revenue from exports, 197; substitutes, 200 f.
Political stability, 212.
Population: composition, 195; concentration, 205; number, 195; proportion rural dwellers, 203.
Productive zones: agricultural, grazing, lumber, mineral, nitrate, fig. 32, 185.
Products, 185 f.
Railways, 198.
Revenue from nitrate exports, 197.
Sheep, number, 203; relative to area, to population, 203.
Size of agricultural holdings, 206.
Standard of living, 196.
Trade, *see* Exports and Imports; per capita, 218.
United States: exports to Chile (value), fig. 6, 14; of manufactures, fig. 6, 14; imports from Chile (value), fig. 6, 14; of copper, quantity, fig. 33,

CHILE (*continued*)
188; of wool, proportion of United States wool imports, 390.
Waterpower, 208.
Zones of production, fig. 32, 185.
CHINA, 280 f.
Agriculture: crop rotation; fertility; irrigation; natural resources; products; room for expansion; terraces, 282 f.
Area, 286; compared with United States, fig. 52, 294.
Audit control as a remedy for her ills, 310.
British opium smuggling, 324.
Canals, extent of, 284.
Canton, manufacturing and trading center, 293.
Canton River Basin, description, 293.
Capital in, 297.
Capital investment, China as a field for, 281, 307.
Central Region, provinces of, 290.
Character of the Chinese, 296, 308.
Chengtu Plateau, 291.
Climate, 290, 291, 293.
Coal: exports, proportion of total exports, 299; reserves, 63, 288, 289, 293, 295, 296, 330.
Complement, of Japan, 322.
Cotton textile industry, number of looms, of spindles, 307.
Disease in, 297.
Economies in consumption, 282, in production, 284.
Exports: (value), fig. 53, 298; to Dutch East Indies, Hongkong, Japan, United Kingdom, United States, fig. 53, 298; major commodities, 298; coal, 299; eggs and egg albumen, sesamum, silk, tea, wheat and wheat flour, proportion of total exports, 298.
Extraterritoriality, 309, 333.
Foreign control in, 309.
Fukien, description, 292; Japanese designs upon, 332.
Government, patriarchal form of, 308.
Great Britain's attitude toward, 334.
Hanyan, steel manufacturing center, 297.
Imports: (value), fig. 53, 298; from Dutch East Indies, Hongkong, Japan, United Kingdom, United States, fig. 53, 298.
Independence, prospects of, 333.
Intervention, 310, 334.
Iron deposits, 288, 289, 292, 293, 299, 330; comparative cost of production, 296.
Irrigation, 284.
Japan, concessions to, 332; designs upon Fukien, 332, Shantung, 329; economic penetration, 332; failure to control peace delegation, 332; progress in aggression, 332; strategy, 327 f.
Labor, quality of, 296.
Latitude of, compared with United States, 298.
"Leased territory," 309.
Livestock, kinds raised, 284.
Market, for consumers' and producers' goods, 280, 306.
Minerals in, 288, 289, 292, 293, 295, 296, 299.
Natural defenses, 282, fig. 49, 283.
North Region, or Yellow River Basin, 287 f.
"Open Door" policy, 326.
Opium smuggling, 324.
Physiographic regions, 286 f.

CHINA (*continued*)
  Population, 280, 286; density, fig. 50, 286; of Shantung, 281; distribution, fig. 50, 286.
  Principles relating to China, decided at the Washington Conference, 333.
  Production: antimony, proportion of world's output, 296; cotton, 295; silk, 280; tin, proportion of world's output, 296.
  Products, 288 f.
  Provinces of, fig. 48, 281; description, products, resources, 288 f.
  Provincial governors, character of, 310.
  Railways, extent, 281; construction hindered by "squeeze," 309.
  Reforms, legislative and judicial, 333.
  Rights of, 333.
  Rotation crops, 282.
  Shantung, Province of, description; resources; density of population, 281; Japanese designs upon, 329.
  Size, disadvantages of, 308.
  Silk, description of process; production; United States imports, 299 f.
  "Spheres of interest," 309, 333.
  "Squeeze" an obstacle to progress, 308.
  Tariff, foreign administration of, 310; revision of, 333.
  Tea, 291, 292; quality, 298; proportion of total exports, 298.
  Tin, production, fig. 63, 351; proportion of world's output, 296; United States imports, fig. 63, 351.
  Topography, fig. 51, 287.
  Treaties, publication of, 333.
  Tungsten in, 296.
  "Twenty-one demands," ultimatum by Japan, 330.
  United States: exports to China, (value), fig. 6, 14; of manufactures, fig. 6, 14; imports from China (value), fig. 6, 14; of silk, quantity, fig. 54, 299; of tin, quantity, fig. 63, 351; policy toward, 325; responsibilities toward, 335.
  Vegetarianism, 284.
  Washington Conference, gains at, 333.
  Western encroachments, 335.
  Yangtse River Basin or Central Region, 290 f.
  Yellow River Basin or Northern Region, 268 f.
Chinese Turkestan, population density of, 286.
Chosen, *see* Korea.
Chungming, density of population, 295.
Climate:
  Amazon region, 149, 177.
  Argentina, 115, compared with Australia, 381, fig. 74, 389; compared with the United States, fig. 18, 125.
  Australia, 381; compared with Argentina, 381, fig. 74, 389.
  Brazil, 139, 149, 160, 177; compared with the United States, 135, fig. 20, 135.
  British Empire, 43.
  Chile, 205.
  China, 290, 291, 293.
  East Indies, 343.
  India, 363.
  Malaysia, 343.
  Mexico, 261, 271, 277.
  New Zealand, 392.
  Santo Domingo, 239.
Climate, size of agricultural land holdings relative to, 277, 384.

Climatic complement of United States, Brazil, 135, fig. **20**, 135.
Climatic differences, permanent basis for trade, 136.
Clothing wool, proportion of United States imports from Argentina and Uruguay; from Australia and New Zealand, 130; United States imports, 130.
Coal:
  Advantages for British trade and shipping, 62 f.
  British control, extent, commercial and political, over world's production, 44.
  Coking, of Campine Basin, 108; Sarre Basin, 106; Westphalia, 106; lack of, in Chile, 209, in Japan, 317.
  Consumption: in British industry, 62; in France, 112; in French industry, 108; in Germany (1870), 112.
  Deliveries by Germany to France, according to terms of Treaty of Versailles, 109.
  Dependence of France, 99.
  Efficiency, in copper smelting, compared with petroleum, 192; of Sarre coal in iron smelting, compared with Westphalian, 106.
  Equivalent of hydro-electric power, 318; of petroleum, 65.
  Exports: of China, in proportion to total exports, 298; of Great Britain: diminishing radius, 64; increasing quantities, 67; importance, compared with exports of wool textiles, 61; compared with cotton textiles, 61; ratio of exports to production, 67; relation to declining competitive advantage in manufactures, 68.
  Factor of the character and location of France's industry, 99.
  Factor in the Industrial Revolution, 30.
  Importance, 61; for British industry, 62, 67; for British shipping, 62, 65; for British trade, 62, 64.
  Imports into France, 108; proportion from Great Britain, 108.
  Index of British industrial situation, 66.
  Influence in strategy of the war, 61.
  Markets for British exports, 64.
  Price, of American, 97; French, 97; Japanese, compared with American, 317; Sarre, compared with Westphalian, 106; Westphalian, 97.
  Production, before the introduction of capitalism, 99.
  Production of, Australia, 388; France, 1871 to 1921, fig. **13**, 98; Germany, 1871 to 1921, fig. **13**, 98; Great Britain, 67, from 1871 to 1921, fig. **13**, 98; proportion to world output, 67; Sarre, 104, 105; United States, 67; 1871 to 1921, fig. **13**, 98; proportion to world output, 67; relative standing, 44, 67; Westphalia, 105; 1870, 111.
  Quality, in Campine Basin, 108; Chile, 209; China, 295; Great Britain, 63; Japan, 317; Sarre, 106; Westphalia, 106.
  Reserves in Australia, 383; Belgium, Campine Basin, 108; Canada, 63; Chile, 209; China, 63, 288, 289, 293, 296, 330; France, 97, 103, 110, compared with Europe, Germany, Great Britain, 97; Great

Coal (*continued*)
    Britain, 63, 317, proportion of world's resources, 63; India, 362; Japan, 317; Sarre Basin, 103, 105; United States, 63; Westphalia, 78, 105.
  Smelting, proportion of German consumption used for, 110.
Coal tar dyes, 80 f.
Coaling stations of Great Britain, 63.
Cochin-China (cō′chĭn chī′nä), 325.
Cocoa (cacao), 151 f.
  Processes of cultivation, harvesting, etc.; food value, 151 f.
  Production, fig. **26**, 153; in Brazil, Ecuador, Gold Coast, St. Thome and Prince, Santo Domingo, Trinidad and Tobago, fig. **26**, 153; in Santo Domingo, 236; proportion of Brazil's, to total world output, 156.
  Room for expansion in Brazil, 156.
  United States imports, quantities, 1873 to 1921, fig. **25**, 152; triennial averages, 151, fig. **26**, 153; value, fig. **8**, 22.
Coconut oil, United States imports, 353; proportion from the Dutch East Indies, the Philippines, 354.
Coconut products, United States imports, 348, fig. **8**, 22; from the East Indies, 348.
Coconut tree, conditions for growing, 354; importance and uses, 352.
Coffee, 136 f.
  Area of coffee-growing region in Brazil, 138.
  Conditions suitable for growing, 139.
  Consumption in the United States, adult per capita, 137.
  Central America, proportion of exports of, 243.
  Cultivation, harvesting, preparation, 139 f.
  Food value, lack of, 137.
  France, imports into, 137; proportion from Brazil, 137.
  History of, 137.
  Production, of Brazil, 136; maximum, 136; annual average, 1919–21, of Brazil, Colombia, Dutch East Indies, Haiti, Guatemala, Mexico, Venezuela, of the World, fig. **21**, 136.
  Region in Brazil, area, producing states, room for expansion, 138.
  United States imports, quantity, 137, fig. **21**, 136; 1870 to 1920, fig. **23**, 141; value, 348, fig. 8, 22; proportion from Brazil, 137; from Central America, 244; from East Indies, 348, 356; proportion of United States imports of foodstuffs, 8.
Coke:
  By-products of coke production, 80.
  Consumption in France (1913), 108; relation to British chemical industry, 109.
  Imports into France, proportion from Germany, 108.
  Process of making, 79.
  Production of Germany, Great Britain, 109.
  Proportions of Sarre and Westphalian for smelting, 106, 108.
  Proportion used in Germany for smelting iron, 108.
Coking coal in Belgium, Campine Basin, 108; in Japan, 317; in Sarre Basin, 106; in Westphalian reserves, 106; lack of, in Chile, 209.

Coir fiber, 352.
Colombia, fig. 14, 115.
  Coffee production, compared with Brazil's, 136.
  United States coffee imports, quantity, fig. 21, 136.
Colonies, French, area and population of, 112.
Combinations in industry, advantages of; encouraged by German government, 73.
Commerce, promotion of, a national objective, 4 f.
Commerce, proportion of population engaged in, in France, in Germany, 5.
Common lands, disadvantages of system, 33.
Competition with United States: prospects of France, 113; of Germany, 92; of Great Britain, 69.
Complementary character of Brazil and United States, 135, fig. 20, 135; of China and Japan, 322.
"Concentrate," copper (8% pure metal), *see* Concentration processes.
Concentration of industry about sources of power, 32.
Concentration of population, *see* Population, concentration.
"Concentration" processes (copper): "flotation" and "gravity," 189.
Concepçion (kŏn sĕp syōn′), coal mines near, 208.
Constanza Valley of Santo Domingo, 238.
Constitutional reforms of Mexico, 276.
Consumers' goods, market for, in Argentina, 132; Brazil, 170; Chile, 195 f.; China, 306; Cuba, 231; East Indies, 346; India, 372.
Consumption, economies in China, 284.
Consumption:
  Bananas, per capita, in the United States, 247.
  Coal, in France (1913), 112; in Germany before 1870, 112; in Great Britain, in industry, 62, per capita, 67, rate of increase, 67; in United States, per capita, 67.
  Coffee, per capita of adult population, in United States, 137.
  Corn, per capita, in United States, 363.
  Cotton, by British textile industry, 50, 316, before and during Industrial Revolution, 29, 30, proportion of world's production, 46; India's, compared with Great Britain's, 49; Japan's, 316, compared with Great Britain's, 316; of United States, 50, per capita, 50.
  Iron, in France (1913), 112; in Germany, before 1870, 112; in United States, per capita, increase of, 57.
  Manganese, United States requirements, 164.
  Meat, United States, possible future requirements, 127.
  Silk, in United States, 300; rate of increase, 300.
  Sugar, in United States, per capita, 221; proportion of world's output, 220.
  Tea, per capita, of Australasia, Great Britain, United States, 299.
  Tin, in United States, proportion of world's output, 350.
  Tinplate, in United States, 1899 to 1920, fig. 62, 350.
  Wool, requirements of United States, 390.

Control, extent:
  American, of Chilean copper production, 194; Mexican copper mining, 270; Mexican silver mining, 269.
  British, commercial and political, over the world's mineral production, 44; petroleum production in Dutch East Indies, 357; tin smelter capacity, 350.
Control of mineral deposits, urgency for, 166.
"Conversion," copper, description of, 193.
"Conversion Office" of Brazil, operations of, 180.
Copper, 187 f.
  American capital control of Chilean mines, 194; of Mexican mines, 270.
  British commercial and political control, extent, 44.
  Deposits, formation of, 188.
  Metals associated with, in ore deposits, 188.
  Processes of concentration, smelting, and refining, 189 f.
  Production, of Africa, fig. 33, 188; Australia, 388; Canada, fig. 33, 188; Chile, maximum, 270; 1879 to 1891, 202; annual average, 1919–21, fig. 33, 188; Japan, maximum, 270; proportion of world's output, 318; annual average, 1919–21, fig. 33, 183; Mexico, 270, fig. 33, 188; Peru, fig. 33, 188; United States, annual average, 1919–21, fig. 33, 188; 1918–21, 203; 1879–91, 202; proportion of total world production, 194; relative standing, 44; world, annual average, 1919–21, fig. 33, 188.
  Resources, of Australia, 383; Chile, location, 194; metal content, 187; proportion of total world resources, 187; China, 292, 296; Japan, estimated proportion of world's resources, 318; United States, estimated proportion of world's resources, 187.
  United States exports, 194; imports, quantity, fig. 33, 188; from Chile, Japan, Mexico, fig. 33, 188; value, fig. 8, 22; proportion of imports from Mexico, 270.
Copra, importance; United States imports, quantity and value, 353; proportion from Dutch East Indies and Philippines, 354; yield per acre, 354.
Coquimbo (kō kēm'bō), 198; iron deposits near, 195.
Cordoba (kôr'dŏ vä), density of rural population, 120.
Corea, *see* Korea.
Corn:
  Acreage in Australia, 388.
  Consumption per capita in India, in United States, 363.
  Exports, from Argentina, 118; proportion of world's, supplied by United States, 8.
  Production, in Argentina, 362, relative standing, 162; in Australia, 388; in Brazil, 162; in India, 362, relative standing, 361; Italy, 362; United States, 362, proportion of world's production, 125, relative standing, 125.
  Relative food value, per acre of land, 127.
Coronel (kō'rŏ nĕl), 198.
Corrientes (kŏr rĕ ĕn'tĕs), province of Argentina, 118.
Costa Rica, financial standing; people, homogeneity; superiority, 252.

Cottage industry in France, 95.

Cotton:

- Consumption by British textile industry, 50, 316, before and during Industrial Revolution, 29, 30, proportion of world's production, 46; India's, compared with Great Britain's 49; Japan's, 316, compared with Great Britain's, 316; in United States, 50, per capita, 50.
- Exports from India, proportion of total exports, 369.
- Imports, of Great Britain, proportion of total imports, 46; of Japan, 316; proportion from India, 316; of United States: quantity, fig. 65, 361, from Egypt, fig. 65, 361; value, fig. 8, 22.
- Produced in China, 288, 291, 293.
- Production, fig. 65, 361; of Brazil, 162, fig. 65, 361; British Empire, proportion of world's production, 43; China, 295; Egypt, fig. 65, 361; India, 295, 362, fig. 65, 361, relative standing, 361; United States, 295, 362, fig. 65, 361.
- United States exports, proportion of world's exports, 8; proportion to Japan, 316, compared with consignment to Great Britain, 316; imports, quantity, fig. 65, 361, from Egypt, fig. 65, 361; value, fig. 8, 22.

Cotton textile industry:

- Adaptation to special conditions, in France, 95, 99; in Great Britain, 50; in United States, 48.
- Capital investment in, Brazil's, 175.
- Capitalistic production, in United States, 51; reversion from, in Great Britain, 51.
- Climate, suitability, in France, Departement du Nord, 100; in Great Britain, Lancashire, 47.
- Consumption of raw cotton, in Great Britain, 50, before and during progress of Industrial Revolution, 29, 30, proportion of world's production, 46; Japan, 316; United States, 50, per capita, 50.
- Dependence for raw cotton, of Japan, 316; Switzerland, 85; United Kingdom, 51, 85.
- Early, in Great Britain, 29; in France, 99.
- Exports, of Japan (value), 49, increase, 49, proportion of total exports, 316; of United Kingdom, 48, compared with United States, 50, decline in proportion to Eastern markets, 49, proportion of total exports, 46; of United States, compared with France, Italy, United Kingdom, 50, to Argentina (piece goods), 124.
- Growth, in Japan, 49; United Kingdom during Industrial Revolution, 29; United States, 50.
- Importance, in France, 103; in United Kingdom, 46; compared with coal, 61, with iron, 55, with wool textiles, 52.
- Imports of piece goods into India, 372.
- Industry, in Alsace, 77, 103; China, 307; France, 99 f.; Germany, 82; India, 372; Japan, 315; United Kingdom, 29 f., 46 f.; United States, 48, 50, 51, 315.
- Inventions, early, 29; relation of supply to demand, 29, 47.

Cotton textile industry (*continued*)
  Labor in United Kingdom, in United States, 48.
  Location of industry in France, before introduction of capitalism, 99, after the introduction, 100; in Germany, dispersion, 82; in United Kingdom, 47.
  Looms, automatic, in United Kingdom, in United States, 48; hand looms in France, concentration, 101; number in Alsace, 1871, 77, in 1921, 103; China, 307; Germany, 1871, 77; Japan, 307.
  Markets, decline in proportion of exports of United Kingdom to Far East, 49.
  Power, use of, in British and American industry, 48.
  Production, in Great Britain, compared with United States, 50; in Chile, value of output, 211; in India, quantity, piece goods, 372; in Japan, value, 315; in United States, 315, compared with France, with Italy, 50.
  Productive efficiency of worker, British compare American, 48.
  Profits, in China, 307.
  Reversion from capitalistic production in Great Britain, 52.
  Specialization, in France, 100; Germany, lack of, 82; Great Britain, 47; Japan, 316.
  Spindles: comparison of mule and ring, 48, 50, 96, 100; number in Alsace, in 1871, 77, in 1921, 103; in China, 307; in Germany in 1871, 77; in Japan, 49, 307, 316; in United Kingdom, compared with Germany, United States, 49, proportion of world's, 49; proportion of ring spindles, in Japan, United Kingdom United, States, 49.
  Union control in Great Britain, 48.
Crompton, invented spinning "mule," 29.
Crop rotation, in China, 282.
Crops: amount of water required, supplied by irrigation, terraces in China, 284; yield, increase by application of fertilizer, 79, 186.
CUBA, 219 f.
  Area, 220; compared with Texas, fig. 37, 217; of sugar cultivation, 229.
  Cocoa growing in, 228.
  Coffee growing in, 228.
  Constitutional relations with the United States, 219.
  Dependence of prosperity on sugar, 232.
  Disease in, 230.
  Expansion of agriculture, opportunity for, 229.
  Exports: (value), fig. 41, 231; to France, United Kingdom, United States, fig. 41, 231.
  Imports: (value), fig. 41, 231; from France, United Kingdom, United States, fig. 41, 231.
  Intervention by the United States, 219.
  Iron production, resources, 229.
  Length, compared with distance from New York to Chicago, fig. 37, 217.
  Market for consumers' goods, 231, for producers' goods, 230.
  Mineral resources, 230.
  Nickel in, 230.
  Population, 220; composition, 231; density, 220, 240.

Cuba (*continued*)
  Political conditions during Spanish domination, 219.
  Products, miscellaneous, 229.
  Reciprocity agreement with United States, 223.
  Sanitation in, 230.
  Shipping service to United States, 231.
  Sugar: importance; processes of cultivation, harvesting, milling; application of capitalistic enterprise; regions, room for expansion; statistics of exports, production, United States consumption, imports, 220 f.
  Sugar, beet, competition of (?), 223.
  Tobacco growing in, 228.
  Topography, 229.
  Trade, per capita, 218, 236.
  United States: exports to Cuba (value), fig. **6**, 14; of manufactures, fig. **6**, 14; imports from Cuba (value), fig. **6**, 14; of sugar (quantity), fig. **38**, 221, proportion of total sugar imports, 221.
Cubitas, iron (brown ore) deposits, 229.
Currency, inflation, apparent advantages of, 90, 213.
Currency, in Argentina, Bolivia, Brazil, 179; Chile, 213; Ecuador, 179; Germany, 90; Peru, Uruguay, Venezuela, 179; effects of fluctuating value on investment and trade, 90.
Cyanamid process for fixation of nitrogen, 200.

Dairen (dī′rĕn), 325, 328.
Death rate, in Bahia, 177; Cairo, 178; Calcutta, 178; Havana, 230; London, 177; Mexico City, 178; Para, 178; Paris, 177; Rio de Janeiro, 177; Santiago, 197; São Paulo, 177; Valparaiso, 197.
Debt, foreign, *see* Foreign debt.
Decadence of France, causes, 93.
Democracy, advantages and disadvantages of, 83; dependent on intelligent "demos," 279.
Density of population, *see* Population, density.
Dependence of nations upon each other, relation to national self-interest, 4.
Dependence of United States upon British banking and shipping facilities, 19.
Dependence upon foreign sources:
  For foodstuffs, danger of, 8; of Germany, in comparison with other European industrial nations, 85.
  For raw materials: deterrent effect upon productive enterprise, 87; of Belgium, for iron, 85; of France, for coal, 99; of Germany, for iron, 85; of Great Britain, for cotton, 51, 85, for iron, 57, 85; of Japan, for cotton, iron, etc., 316; of Switzerland, for cotton, iron, silk, 85.
Depreciating currency, apparent advantages, 90, 213; disadvantages, 90; *see* also Currency.
Diamonds, in Brazil, 165; United States imports, fig. **8**, 22.
Diaz, Porfirio (dē′äs), dictator of Mexico, constructive reforms; failure to educate the Indian, 274.
Diesel, Rudolph, inventor of engine burning crude petroleum for fuel, 65.
Diesel engine, efficiency of, 65.

"Diminishing returns" explained in terms of increasability of factors of production, 38.
Disease in Brazil, 177; in China, 297; in Cuba, 230; in India, 368.
Distance:
  London to Calcutta, 45, to Port Darwin, Australia, 44, to Rio de Janeiro, 176, to Sydney, 45.
  New York, to Australia, 390, to Rio de Janeiro, 176.
  San Francisco to Japan, 341.
  Yokohama to Calcutta, 45, to Hawaii, 341, to Philippines, 341, to Sydney, 45.
Distribution of population, *see* Population, distribution.
Diversification of crops in the banana industry, 247.
Dominican Republic, *see* Santo Domingo.
Droughts, in Argentina, 121; in Australia, 381.
Dutch East Indies, 343 f., *see* Malaysia.
  Area, 343; proportion of total area of Malaysia, 343.
  Capital investment, field for, 357.
  Climate, 343.
  Exports, excess over imports, explained, 344, to United States, 344.
  Government in, 359.
  Imports, from the United States, 344; proportion from United States, 347.
  Market for consumers' goods, 346; for producers' goods, 347.
  Petroleum: production, 357, fig. 46, 263; extent of British control, 357; importance for British shipping, 357.
  Population, 343; concentration, 343; proportion white, 346; proportion of total population of Malaysia, 343.
  Rubber, acreage of plantations, 348; production, fig. 61, 347; United States imports, quantity, fig. 61, 347.
  Standard of living, 346.
  Sugar production, quantity, fig. 38, 221; United States imports, quantity, fig. 38, 221.
  Tin, 349; opportunity for American enterprise, 351; production, quantity, fig. 63, 351; proportion of world output, 351; United States imports, quantity, fig. 63, 351.
  Tobacco, distinctive quality, 356.
  Trade with the United States, 344; "indirect" trade with, 346.
  United States exports: to Dutch East Indies (value), fig. 6, 14, of manufactures, fig. 6, 14; imports from Dutch East Indies (value), fig. 6, 14; of coconut oil, 353, proportion from, 334; of coffee, quantity, fig. 21, 136; of copra, 353, proportion from, 354; of rubber, quantity, fig. 61, 347; of sugar, quantity, fig. 38, 221; of tin, quantity, fig. 63, 351.
Dye industry, and war, 82; of England; of Germany, 80.
Dye woods in Brazil, 158.
Dyes, aniline, 80 f.

Earthquakes in Japan, 313.
Eastern problem of the United States, 335 f.
East Indies, *see* Malaysia (also British East Indies, Dutch East Indies, Philippines).
Economic development of Japan, compare Great Britain, 314.

Economic penetration in China, by Japan, 332.

Economies in consumption in China, 284; in production, 282.

Ecuador, production and United States imports of cocoa from, fig. 26, 153.

Education in Australia, 383; in India, 375; in Mexico, a basic necessity, 279; in Santo Domingo, 239.

Eggs and egg albumen, proportion of total exports from China, 298.

Egypt, production of cotton; United States imports from, quantity, fig. 65, 361.

Elasticity of demand for manufactures, compared with foodstuffs, 123.

Elasticity of factors of production, the measure of industrial prospects, 38.

Electrical appliances, market in Brazil, 174.

Electricity (*see* also Waterpower), opportunity to develop, in:
- Brazil, 173, advantages for railways of, 172.
- Chile, 208, project for longitudinal transmission system, 208.
- France, 110.
- Japan, 318, project for single super-power system, 318.
- Santo Domingo, for sugar milling, 239.
- United Kingdom, 62, 110.

Electricity, in France, relation to cottage industry, 96; use in manufacturing, 96, footnote.

Electrolytic copper refining, process, 193.

Emigration, supervision by German government, 76.

Emperor of Germany, powers, 72; of Japan, 319.

Empire of Japan, area and population of, 311.

Employees, number in Chile's manufactures, 208, in Japan's manufactures, 317; proportion of Japan's factory employees females, 317, in United States, 317.

England, population, density, 5, growth since 1800, 8.

Entrepôt, Manila, Philippines, as, 341; Singapore as, 344.

Entre Rios (ĕn′trĕ rē′ŏs), cattle raising province in Argentina, 118.

Equivalents: coke in terms of Sarre, coal, 108; petroleum in terms of coal: for copper smelting, 192, for ship fuel, 65; waterpower in terms of coal, 67, 318.

Esperito Santo (ĕs pē rĕ′to͝o sän′to͝o), coffee state of Brazil, 138.

Europe:
- Area, compared with the United States, fig. 7, 15.
- Caribbean interests of, 256.
- Field for American investment (?), 23.
- Monetary situation, and Mexican silver, 267.
- Trade between countries of, analogous to domestic trade, 16.
- United States, proportion of trade with, 12.

European nations, comparative area, fig. 7, 15.

Expansion, possibility of, in Argentina, 118; Australia, 380, 381; Brazil, cattle raising, 160, cocoa growing, 156, coffee growing, 138, rubber production, 144; Chile, 206; China, 295; Cuba, 229; Malaysia, rubber, 349; Philippines, manila hemp production, 355; Santo Domingo, 237.

Expansion, territorial, Japan's objective, 322.

Exports, commodities, *see* specific commodity.

Exports, countries, *see* under specific country.

Exports, excess, from Chile, explained, 197; from the East Indies to Europe, 345; to United States, relation to excess exports from United States to Europe, 346.

Exports, major, from Argentina, 124; Australia, 389; Brazil, 134; Central America, 243; Chile, 185; China, 298; Cuba, 228; France, 94; Germany, 78; Great Britain, 46, 52, 55, 60; India, 369; Japan, 315, 316; Malaysia, 348; Mexico, 262; New Zealand, 392.

Export trade, effect of currency inflation upon, 91.

Extraterritoriality, principle of, 309, 333.

Factors of Germany's ascendancy, 83; of Industrial Revolution, 28 f.; of Japan's ascendancy, 319.

Famine, in China, 288, 290; in India, government measures to mitigate, 364; in Mexico, 277.

Far Eastern Republic, 329.

"Favorable" balance of trade, 346.

Federated Malay States, area and population, 343.

Federation of Central American states, inherent instability, 251.

Fertility of soil, in Argentina, 117; Brazil, 139, 160; Central America, 242; China, 289 f.; France, river valleys, 102; Germany, Rhine Valley, 79; Mexico, 261; New Zealand, 392; Porto Rico, 241; Santo Domingo, 238.

Fertilizer:
- Basic slag, by-product of basic steel production, used in Germany, 78.
- Legumes, value as, in rotation with non-leguminous crops, 282.
- Nitrate salts of Chile, 186.
- Organic sources of nitrogen, used by Chinese, 283.
- Phosphates, from African colonies, used by France, 102.
- Potash salts, German pre-war monopoly, 81; recovery of Alsatian deposits by France, 102.
- Sewage, waste of nitrogen, phosphate, and potash content in United States, 283.

"Fiat" money, effect upon prices, 90.

Fiji Islands, 342, footnote.

Financial collapse of Germany, contrast with France and United States in 18th century, 92.

Financial condition of Brazil, 181; Chile, 213; Costa Rica, 252.

Finland, area compared with other European countries, fig. 7, 15.

"Fixation" methods, of atmospheric nitrogen, 200.

Flax, proportion of world's production in Canada and India; in British Empire, 43.

Flaxseed (linseed), production in Argentina, 362; in India, 362, relative standing, 361; United States, proportion of

world's, 125; imports, value, fig. 8, 22.
"Flotation" method of copper concentration, 189.
Flying time between London and Australia, 44.
Food value of:
  Banana, 246, compare potatoes, wheat, 246; banana flour, compare wheat flour, 247.
  Beef, relative, per acre of land, 127.
  Cocoa, 151.
  Coffee, lack of, 137.
  Corn, relative, per acre of land, 127.
  Eggs, 284.
  Milk, relative, per acre of land, 127.
  Mutton, relative, per acre of land, 127.
  Oats, relative, per acre of land, 127.
  Peanuts, relative, per acre of land, 127.
  Pork, 284; relative, per acre of land, 127.
  Potatoes, compare bananas, 246; relative, per acre of land, 127.
  Soy bean, 285.
  Sugar, 220.
  Wheat, compare banana, 246; relative, per acre of land, 127.
Foods and materials, declining proportion of United States exports, 11.
Foodstuffs, dependence for, of European industrial nations, 8, 85; imports, per capita, of Belgium, Germany, Switzerland, United Kingdom, 85; independence of Germany, 85, Japan, 315, United States, 8; proportion of United States exports, 8, fig. 4, 10; of United States imports, 12, fig. 4, 10.
Foreign control in China, 309.
Foreign debt, of Argentina, per capita, 181; Brazil, 181, per capita, 181, 213; Chile, 213, per capita, 213; Mexico, 278; Santo Domingo, 234; United States in 1868, 182.
Foreign investment, *see* Capital investment.
Foreign population of United States, proportion of total, 16.
Foreign trade of Argentina, fig. 17, 123; Australia, fig. 70, 378; Brazil, fig. 31, 175; Chile, fig. 34, 196; China, fig. 53, 298; Cuba, fig. 41, 231; France, compared with Germany in 1870, in 1913, 94; India, fig. 68, 369; Japan, fig. 57, 316; Mexico, fig. 47, 272; New Zealand, fig. 75, 392; Philippines, fig. 60, 345.
Foreign trade, promotion of, by German government, 75.
Forest products of Brazil, 134, 158; Chengtu Plateau, 292; Sumatra, 358.
"Fragmentation" of agricultural holdings in India, 366, fig. 67, 367.
FRANCE, 93 f.:
  Æsthetic taste in relation to capitalistic production, 96.
  Agriculture, proportion of population engaged in, 5, 94; size of holdings, 95.
  Area, compared with Europe and other countries of Europe, and the United States, fig. 7, 15; with Germany in 1870, 93.
  Capital investment, in Argentina, 124; Brazil, 176; Mexico, 278.
  Capitalistic production, as affected by paucity of coal, 99.

FRANCE (*continued*)
- Coal, consumption, 112; factor determining her industrial character, 99; imports, annual, 108; price of French, compared with German and American, 97; production, 1871 to 1921, fig. 13, 98; reserves, actual or known, 97, 103, 110.
- Coke, consumption; imports, proportion from Belgium and Germany; requirements; market for British, 108.
- Colonial possessions, area and population, 112.
- Commerce, foreign, in 1870 and 1913, compared with German, 94; proportion of population engaged in, 5.
- Cottage industry, 95, perpetuated by use of electricity, 96.
- Cotton textile industry: adaptation to special conditions, 96 f.; importance, 103; in Alsace, 1871, 77; 1921, 103; location, before introduction of capitalistic production, 99, after introduction, 100; looms: concentration of hand looms, 101; in Alsace in 1871, 77, in 1921, 103; specialization, 100; spindles, number in Alsace in 1871, 77, in 1921, 103.
- Decadence, causes, 94.
- Electric power used in industry, per establishment, 96, footnote.
- Electricity: factor in perpetuating cottage industry, 96; potential power, 110.
- Exports, typical commodities, 94; manufactures, fig. 3, 9.
- Fertility of soil, 102.
- Fertilizers used in, 103.
- Imports of coal, 108; of coffee, 137.
- Industrial renaissance, 102.
- Industry, adaptation to special conditions, 96 f.; cottage, 95; location before introduction of capitalistic production, 99, after introduction, 100; proportion of population engaged in, 5; small size of plants, 96; specialization on quality goods, 95.
- Iron, consumption, 112; production, 103, fig. 11, 58, per worker, 112; relative standing, 103; resources, 103.
- Iron and steel industry, location before, 99, and after introduction of capitalism, 101; national aspirations, 88.
- Losses in war, 101.
- Merchant marine, 314.
- Population, fig. 2, 7, compared with Germany in 1871, 95, fig. 2, 7; density, 5; growth from 1800, fig. 2, 7; proportion engaged in agriculture, 5, 94, in commerce, in industry, 5; rural, proportion of, 94.
- Potash reserves, Alsatian, extent, quality, recovery of, 102.
- Readjustment, problem of national economic, 104.
- United States: exports to France (value), fig. 6, 14, of manufactures, fig. 6, 14; imports from France (value), fig. 6, 14, of calfskins (pieces), fig. 19, 128.
- Water power, extent, location, potential, 110.
- Wool textile industry, character and location, 96, 99, 100.

Franco-Prussian War, 77.
Fruits in Brazil, 157.
Fuel, petroleum for ships, 65, 265.

Fukien (fo͞o′kĭ ĕn′), Province of, description, products, 292; Japanese designs upon, 332.
Furs, proportion of exports from Australia to United States, 390; United States imports, (value), fig. 8, 22.

Ganges, plain of, agricultural region of India, 365.
Genro, power of, 319.
Geographic specialization in British cotton textile industry, 47.
GERMANY, 70 f.:
  Acquisition of Alsace-Lorraine, 77; of Kiauchow, 330.
  Area, compared with Europe and other European nations, and with the United States, fig. 7, 15; with Texas, fig. 12, 84.
  Ascendancy, factors of, 71 f., 83.
  Banks, control of industry, 74; government supervision of, 74; promotion of foreign trade, 75.
  Capital investment in Argentina, 124; in Mexico, 278.
  Chemical industry, 80.
  Coal, consumption before 1870, 112; deliveries to France according to terms of Versailles Treaty, 109; production, 1871 to 1921, fig. 13, 98; of Sarre Basin, production 1913, 105; of Westphalian Basin, advantages, 78, contrasted with Sarre, 105; price (1913) compared with French and American, 97; production, 105; reserves, 78, 84.
  Coke, consumption in iron smelting, 1913, 108; production, 109.
  Commercial schools, 76.
  Currency inflation, 90.
  Dependence for foodstuffs (?), 85; for iron, 85.
  Dye industry, 80.
  Economic situation, compared with other industrial nations of Europe, 87; requiring transition to "quality production," 88.
  Exports, 91; iron and steel manufactures, proportion of total exports, 78; manufactures, fig. 3, 9.
  Factors, of ascendancy, 71 f., 83; of production, effect of Treaty of Versailles upon increasability, 88.
  Financial collapse, 92.
  Foodstuffs, dependence for (?); imports per capita, 85.
  Government, form of, 73; history, 72.
  Government control of banks, 74, of industry, 74; promotion of commercial schools, 76, of foreign trade, 75; supervision of emigration, 76.
  Imports of foodstuffs, per capita, 85.
  Indemnity, bearing upon industrial policy and economic recovery, 89.
  Industrial policy, post-war, 89.
  Industry in 1870, 76.
  Iron, consumption before 1870, 112; output per blast furnace, 112, per worker, 112; production (pig), fig. 11, 58; proportion contributed by Lorraine, 78; reserves, loss of, 84.
  Iron and steel industry, 78.
  Labor, depreciation through currency inflation, 91.
  Livestock per 1000 persons, 86.
  Losses under Treaty of Versailles, 84 f.
  Population, fig. 2, 7; density, 5, rural, 5, urban, 5; distribution by occupation 1870, 76;

GERMANY (*continued*)
growth, 18, fig. 2, 7, since 1871, 8; proportion engaged in agriculture, commerce, industry, 5.
Potash in, 81; basis of "heavy" chemical industry, 81; consumption, 81; loss of Alsatian deposit by Treaty of Versailles, 84; pre-war monopoly, 79; production, 82.
Production per acre of land, of barley, oats, potatoes, rye, wheat, 79; per 1000 persons, of barley, oats, potatoes, rye, sugar beets, wheat, 86.
Prospects of future competition with United States, 92.
Readjustment, problem of, 88.
Resources, post-war, compared with other European industrial nations, 84 f.
Shipping agreement with American interests, 86.
South German Confederation, 71.
Tariff, employment to promote trade, 75; tariff union, 71.
Textile industries in, 82.
United States: exports to Germany (value), fig. 6, 14, of manufactures, fig. 6, 14; imports from Germany (value), fig. 6, 14.
Water power, potential, 110.
Wool textiles, exports compared with British, 53.
Yield per acre, of barley, oats, potatoes, rye, wheat, 79.
Zollverein, 71; transition of German Empire from, 72.
Ghandi, Indian nationalist, 375.
Gilchrist, co-discoverer with Thomas of basic process of manufacturing steel, 78.
Goats, number, 362, relative standing of India, 361; per 1000 persons in Belgium, Germany, Switzerland, 86.
Goatskins, quality of Brazilian, Indian, Mexican, 371; United States imports, proportion from India, 371, value, fig. 8, 22; uses, 371.
Gold, extent of British commercial and political control over world's production, 44; in Australia, 383, production, 388; in Brazil, 165; in Chile, 185, proportion of world's output, 185; in India, proportion of world's output, 362; monetary qualities, 268.
Gold Coast, production; and United States imports of cocoa from (quantity), fig. 26, 153.
Goodyear, invented process of vulcanizing rubber, 144.
Government, of Brazil, 182; China, 308; German Empire, 72; Japan, 319; Mexico, 278.
Government, in business enterprise in Japan, 320; control of banks in Germany, 74, in Japan, 320; of industry, in Germany, 74, in Japan, 320; ownership of railways in Australia, 386, in Chile, 198, in Germany (states), 74; promotion of foreign trade in Germany, 75; supervision of emigration from Germany, 76.
Goyas (gō′yäsh), 159; climate, 177.
Grains, proportion of India's exports, 369.
Gran Chaco, northern boundary of Argentine pampas, 114.
Graphite, extent of British commercial and political control over world's production, 44.
"Gravity" process of copper concentration, 190.

Great Britain, 25 f.
  Agrarian movement in England in the 18th century, 33.
  Agriculture: arable land, area of, 315; landholdings, size of, 315; livestock per 1000 persons, cattle, sheep, swine, 86; production per 1000 persons, of barley, oats, potatoes, wheat, 86; proportion of population engaged, 94, 314; yield per acre of barley, wheat, 315.
  Area, compared with East Indies, fig. 58, 340; with Europe and other European nations, fig. 7, 15; with Japan, 311, fig. 56, 312; with Texas, fig. 10, 42; with United States, fig. 7, 15.
  Capital investments, in Argentina, 124; Argentine railways, proportion, 124; Brazil, 176; Mexico, 278.
  Capitalistic production, reversion from, 51, 55, 57.
  Caribbean interests, 256, 267.
  Cattle, number of head, fig. 19, 128; per 1000 persons, 86.
  Chemical industry, 80; relation to France's coke requirements, 109.
  Coal trade, 60 f.
    Advantage in shipping, 62, 66; in trade, 62, 64.
    Bunkering stations, 63.
    Consumption in industry, proportion, 62, per capita, 67.
    Exports, 67, compared with exports of wool textiles, 61; diminishing export radius, 64; increase, in relation to declining competitive strength in manufactures, 68; net purchasing power, compared with exports of cotton textiles, 61; principal markets, 64; proportion of total exports, 61; ratio to production, 67.
    Production, 67, from 1871 to 1921, fig. 13, 98; proportion of world output, 67.
    Proximity of high-grade coal to sea, 62.
    Quality of, 63.
    Reserves, 63, 317; in proportion to world's resources, 63.
  Coke, market, in France, 109; production of, 109.
  Competition with the United States, prospects, 69.
  Control, commercial and financial, over world's mineral production, 44; over oil fields, 65, 265, and petroleum output in the Dutch East Indies, 357; extent, over tin deposits and smelter capacity, 350.
  Cotton, consumption, 50, 316, before the Industrial Revolution, 29, proportion of world's production, 46; imports, proportion of total imports from United States, 26.
  Cotton textile industry: birthplace of Industrial Revolution, 29 f.; importance, special advantages, dependence for raw cotton, reversion from capitalistic production, relative decline, statistics, 46 f.
  Death rate in London, 177.
  Dye industry, 80, 109.
  East Indian possessions, 343, fig. 58, 340.
  Electricity, potential power, 62, 110.
  Exports:
    Coal, 67; proportion of total exports, 61.
    Cotton textiles, 48, proportion of total exports, 46.

GREAT BRITAIN (*continued*)
- Iron and steel manufactures, net purchasing power, 55.
- Manufactures, fig. 3, 9; to United States, proportion of total, 26.
- Wool textiles, 53; proportion of total exports, 52.

Exports to United States, composition, 26; 1870 to 1920, showing proportion of reexports, fig. 9, 27.
Factors of Industrial Revolution, 28 f.
Foodstuffs, imports per capita, 85.
Industrial Revolution, 28 f.
Industries, 46 f.
Iron, production (pig), fig. 11, 58; per blast furnace, 112, per worker, 112; proportion of world output, 57; reserves, 56, 318.
Iron and steel industry, 55 f.
Land holdings, size, 315.
Livestock, number of head per 1000 persons: cattle, sheep, swine, 86.
Merchant marine, 314.
Petroleum, importance of Mexican, 265; control of production, 44, in Dutch East Indies, 357; control of resources, 65.
Policy of government, toward private enterprises abroad, 267; toward China, 334; toward India, 373, 376.
Population, fig. 2, 7; density, 314; growth, 18, fig. 2, 7; proportion engaged in agriculture, 94, 314.
Ports, 36.
Power, use in industry, 59.
Production per 1000 persons, of barley, oats, potatoes, wheat, 86.
Reëxports to United States, 26, fig. 9, 27.
Sheep, number of head, fig. 73, 385; per 1000 persons, 86.
Sheepskins, United States imports (pieces), fig. 73, 385.
Tea, per capita consumption, 299.
United States: exports to Great Britain (value), fig. 6, 14, of manufactures, fig. 6, 14; imports from Great Britain (value), fig. 6, 14; of sheepskins (pieces), fig. 73, 385.
Water power, actual and potential, 62, 110.
Wool, declining proportion of imports from Australia, 55.
Wool textile industry; importance; reversion from capitalistic production, 52 f.
Yield per acre of barley, wheat, 315.

Guatemala: cattle ranging, area per head required, 242; coffee production and United States imports, fig. 21, 136.
Guayra (gwī′rä) Falls, of Brazil, 173.
Gums and resins in Brazil, 134, 158.

Haber process of nitrogen fixation, 201.
Haiti, Island of, fertility of soil, 237; size compared with Cuba, 233; topography, 237.
Haiti, Republic of: area, political instability, intervention, population composition and density, 233 f.; United States imports of coffee from (quantity), fig. 21, 136.
Harbors, of Brazil, 171; of Chile, 198; of Great Britain, 36; of Santo Domingo, 238; of United States, 36.

Hargreaves, James, invented spinning "jenny," 29.

Havana, Cuba, death rate in, 230; port equipment, 232; shipping, tonnage, value, 232.

Hawaii, distance to Japan, 341, methods in sugar cultivation, 225; rice yield per acre, 315; sugar production, quantity, fig. 38, 221.

Hay, John, formulated policy of the "Open Door," 326.

Health conditions, in Australia, 381; in Brazil, 177; in Cuba, 230; in New Zealand, 392; in Santo Domingo, 239.

Hemp, Manila, description, requirements for growing, 354 f.; United States imports, from East Indies, 348.

Herodotus, account of early method of collecting gold, 189.

Herval Falls of Brazil, potential power, 174.

Hevea, species of rubber tree, 146.

Hides, Brazil as a source of, 162; livestock product needed by the United States, 128, 161; proportion of exports of Australia to United States, 390, of India's exports, 369, of New Zealand's, 392; United States imports (pieces), fig. 19, 128 (value), fig. 8, 22.

Hides and tallow, commercial products of frontier livestock, 117.

Hindu religion in India, 367.

Hoang-ho (hwäng'hō'), Yellow River, China, 287.

Hokkaido (hŏk'kī'dō), area, 312.

Holland, *see* Netherlands.

Honan (hō'nän'), Province of, description, 288.

Honshiu (hŏn'sho͞o'), area, length, 311.

Hunan (ho͞o'nän'), Province of, description, products, 291.

Hupeh (ho͞o'pĕ'), Province of, description, products, 291.

Hydro-electric power, in Brazil, 173; in Chile, 208; France, 110; Great Britain, 62, 110; Italy, 110; Japan, 318; Santo Domingo, 239; Spain, 110; Sweden, 110; Switzerland, 110; United States, 67, 173: New Hampshire, New York, Niagara, 62.

Ili (ē lyē'), Chinese territory acquired by Russia, 325.

Illiteracy in India, 376; Mexico, 279; Santo Domingo, 239.

Immigration, into Argentina, proportion of total population, 142; into Australia, of colored races, forbidden, 379; into Brazil, encouraged, proportion of total population, sources of, 142; into Chile, discouraged, 206, 209.

Imports, *see* under specific commodity or country.

Improvements in industry, tendency to broaden consumption demands, 41.

Inclosure of common lands, 33.

Increasability of factors of production, in China, 324; in French iron and steel industry, 111; Germany, effect of Treaty of Versailles, 88; Great Britain, cotton textile industry, 51 f., iron and steel industry, 57; Japan, iron and steel industry, textile industries, 316; law of "increasing returns" explained in terms of, 40; the fundamental measure of industrial promise, 38 f.

Indemnity, German, 89, 109.

INDIA, 360 f.
  - Agricultural region in, 365.
  - Agriculture, 365 f.
  - Area, 361, compared with United States, fig. 64, 360.
  - Bazaars, direct trade with, 373.
  - Bolshevism in, 375.
  - British policy toward, 373, 376.
  - British possessions distinguished from native states, fig. 69, 374.
  - Caste system, 367.
  - Climate, 363.
  - Cattle, number, 362, fig. 19, 128; proportion of world's, 43, 361.
  - Coal reserves, 362.
  - Corn, consumption per capita, 363, production, 362, relative standing, 361.
  - Cotton, consumption, compare Great Britain, 49; exports, proportion of total, 369; production, quantity, 295, 362, fig. 65, 361, relative standing, 361.
  - Cotton textiles: imports and production of piece goods, 372.
  - Disease in, 368.
  - Education in, 375.
  - Exports: (value), fig. 68, 369; to Japan, United Kingdom, United States, fig. 68, 369; commodities; cotton, grain, hides and skins, jute, tea, proportion of total exports, 369; rice, proportion of crop; wheat flour, 363.
  - Famine, 363; government measures to mitigate, 364.
  - Fragmentation of land holdings, 366, fig. 67, 367.
  - Goats, number, 362, relative standing, 361.
  - Goatskins, proportion of exports to United States, 369; proportion of United States imports from, 371; quality of, 371.
  - Hindu religion, 367; deterrent to economic progress, 368.
  - Ignorance in India, 376.
  - Imperial tariff, effect upon American trade, 377.
  - Imports: (value), fig. 68, 369; from Japan, United Kingdom, United States, fig. 68, 369; proportion from Japan, United Kingdom, United States, 373; of cotton piece goods, 372.
  - Independence movement, 376.
  - Indian Mutiny, 374.
  - Industries in, 372.
  - Iron and steel output of Tata Iron and Steel Works, 372.
  - Irrigation, acreage served by canals, reservoirs, wells, 365.
  - Japanese influence, 334.
  - Jute: process of cultivation, harvesting, preparation of fiber, 369 f.; production, 362, monopoly of, 361; proportion of total exports; of exports to United States, 369; yield of fiber per acre, 370.
  - Land holdings, 366, fig. 67, 367.
  - Market, for consumers' goods, 372; for producers' goods, 373.
  - Minerals of, 362.
  - Native states, distinguished from British territory, fig. 69, 374.
  - Opium traffic with China, 324.
  - Policy of Great Britain toward, 373, 376.
  - Political apathy, 376.
  - Population, 361; concentration, 365; distribution, fig. 66, 364; proportion engaged in agriculture, 361.
  - Poverty, 368.
  - Production of agricultural products, 362, relative standing,

INDIA (*continued*)
    361; of minerals, relative standing, 362.
  Products, commercial, 369.
  Radicalism, 375.
  Railways: concentration; extent in proportion to area; factor to reduce menace of famine, 364.
  Rainfall, 363.
  Religious unrest, 376.
  Rice, production, 362, relative standing, 361; yield per acre, 315.
  Sheep, number of head, 362, fig. 73, 385; relative standing, 361.
  Shellac, cultivation, process, 371.
  Standard of living, 368.
  Sugar, production, 362, fig. 38, 221, relative standing, 361; proportion of total imports, 363.
  Swadeshi movement, 376.
  Tea, production, 362; relative standing, 361; proportion of exports, 369.
  United States: exports to India (value), fig. 6, 14, of manufactures, fig. 6, 14; imports from India (value), fig. 6, 14; of calfskins (pieces), fig. 19, 128; of cattle hides (pieces), fig. 19, 128; of goatskins, proportion from, 371, proportion of total imports from, 369; of jute and jute manufactures, proportion of total imports, 369; of sheepskins (pieces), fig. 73, 385.
  Western civilization in, 373.
  Wheat, consumption per capita, compare American, 363; production, 362, relative standing, 361.
Indian population in Brazil, 166; in Chile, 185, 195; in Mexico, proportion of total population, 275.
Indirect trade, 20, 346, 390.
Industrial combinations, advantages of; encouraged by German government, 73.
Industrial development of Germany, 76 f.; of Great Britain, 27 f.; of Japan, 315; of United States, 10.
Industrial improvements opposed by labor, 31; tendency to broaden consumption demands (contrast agricultural improvements), 41.
Industrial legislation in Australia, 383.
Industrial policy of Germany since War, 89.
Industrial promise, measure of, 38 f.
Industrial renaissance in France, 101.
Industrial Revolution, factors of, 28 f.; fundamental explanation, 38.
Industries, manufacturing, in Argentina, 122; Australia, 387; Brazil, 174; Chile, 207; China, 297; France, 95 f.; Germany, 77 f., in 1870, 76; Great Britain, 46 f.; India, 372; Japan, 315.
Industry, advantages of, 5 f.; danger of overdevelopment, 8; government encouragement of, in Australia, 387; importance for maintenance of British Empire, 45; promotion of, a national objective, 5 f.; proportion of population engaged in: Australia, 387, Brazil, 175, France, 5, Germany, 5, United States, 175,

387; separation from agriculture, 40.
Inflation of currency, effects of, 90.
Instability, political, characteristic of "Middle America," 215; inherent in character of people, 251, 272; intervention as a remedy, 253.
Integration, industrial, in Germany, 73; of banks, 74.
Interest of United States, 4 f., in Argentina, 124 f.; Australia, 378; Brazil, 183; Central America, 242; Chile, 214; China, 306 f.; Cuba, 230 f.; Dutch East Indies, 357; Europe, 16 f., 21; extra-European countries, 21; France, 93; Germany, 70; Great Britain, 27; India, 377; Japan, 335; Malaysia, 344; Mexico, 262 f.; "Middle America," 215; New Zealand, 392; Philippines, 339; Santo Domingo, 239.
Internationalism *vs.* nationalism, 4.
Intervention in Central America, 253; in China, 310, 324 f.; Cuba, 219; Haiti, 236; in Santo Domingo, 234 f.
Inventions, and the law of supply and demand, 29; in early cotton textile industry, 29.
Investment, *see* Capital investment.
Iodine, by-product of Chilean nitrate industry, 195.
Iquitos (ē kē′tōs), rubber town on Amazon tributary, 145.
Iron:
  British commercial and political control, extent, over world's production, 44.
  Consumption, in France, 112; in Germany before 1870, 112.
  Dependence upon imports, Belgium, 85; Germany, 85; Great Britain, 57, 85; Switzerland, 85.
  Distance of ore carriage, to coal, in United States, 111; to tidewater, from mines in Minas Geraes, 164.
  Factor in Industrial Revolution, 30.
  Imports into United States from Cuba, 229.
  Output per blast furnace in Germany, Great Britain, United States, 112.
  Production of Cuba, 229; France, 103, from 1871 to 1920, (pig), fig. II, 58; Germany, from 1871 to 1920, (pig), fig. II, 58; Great Britain, from 1870 to 1920, (pig), fig. II, 58; proportion of world production, 57; India, 362; Japan, 318; Lorraine, or Lorraine Annexée, 78, 103, proportion of total German ore production, 78; Luxemburg, 103; United States, from 1871 to 1920, (pig), fig. II, 58, relative standing, 44, 57.
  Production per worker, in France, Germany, Great Britain, United States, 112.
  Reserves in Australia, 383; Brazil, 164; Chile, 194; China, 288, 289, 292, 293, 299, 330; Cuba, 229; France, 103; French Lorraine, 103; Great Britain, 56, 318; Japan, 318; Lorraine Annexée, 103; Lorraine basin, 109.
  Uses, 55.
Iron and coal, influence upon strategy of the war, 61.
Iron and steel, basis of national power, 55; imports into Japan, 318.

Iron and steel industry, in France, location before introduction of capitalistic production, 99, after introduction, 101; in Germany, 78; in Great Britain, 55, affected by reversion of British industry from capitalism, 57; in Lorraine, 1870, 77.
Iron and steel manufactures, proportion of total exports from Germany, 78; from Great Britain, 55; from United States, 60.
Irrigation in Australia, 381; China, 284; India, 365; Mexico, 261.
Italy: area compared with Europe and other European countries, fig. 7, 15; corn, production, 362; rice, yield per acre, 315; silk, production, fig. 54, 299; United States exports to Italy, fig. 6, 14, of manufactures, fig. 6, 14; imports from Italy, fig. 6, 14; water power, potential, 110.

Jamaica, proportion of world's banana exports from, 248.
Japan, 311 f., fig. 56, 312.
  Acquisition, of German colonies in Pacific, 331, of Formosa, 325; of Kiauchow, attempted, 331; of Korea, 325, 327; Liaotung Peninsula, 327; Pescadores, 325; Riu Kiu Islands, 325.
  Agriculture, 315; area of arable land, 314; proportion of population engaged in, 314; yield per acre, of barley, rice, wheat, 315.
  Area, 311; compared with British Isles, fig. 56, 312.
  Attitude toward Western civilization, 320.
  Autocratic government, control of banks and industry, 320; responsible for economic progress, 319.
  Civilization and culture, debt to China, 313.
  Coal: deposits, location, price, quality, reserves, 317 f.
  Complement, natural, of China, 322.
  Copper, production, fig. 33, 188, maximum (1917), 270; proportion of world's output, 318; resources, estimated proportion of world's, 318.
  Cotton, consumption; proportion of imports from India, of United States exports to Japan, 316.
  Cotton textile industry, 315; dependence for materials, 316; growth, 49; number of looms, 49, of spindles, 49, 307, 316; value of exports, 49, of output, 315.
  Defensive strength, 335.
  Dependence of industries for materials, 315.
  Designs, in entering World War, 330; upon China, 331; on Fukien, 332; upon Liaotung Peninsula, 327; upon Manchuria, 328; upon Mongolia, 328; upon North Sakhalien, 329; upon Shantung, 329; upon Siberia, 329.
  Distance to San Francisco, 341; from Yokohama to Calcutta, 45; to Hawaii, 341; to Philippines, 341; to Sydney, 45.
  Earthquakes, 313.
  Economic development, 307, 314.
  Economic penetration in China, 332.
  Empire of, area, 311; compare

JAPAN (*continued*)
British Isles, fig. 56, 312; length, population, 311.
Exports: (value), fig. 57, 316; to China, Dutch East Indies, India, United Kingdom, United States, fig. 57, 316; of manufactures, proportion of total, 315.
Fishing, a means of livelihood, 314.
Government in business enterprise, 320.
Hydro-electric power, 318.
Imports: (value), fig. 57, 316; from China, Dutch East Indies, India, United Kingdom, United States, fig. 57, 316; of cotton, 316; iron and steel, 318; of machinery, proportion from United States; proportion of total imports, 317; materials, proportion of total imports, 315.
Independence for foodstuffs, 315.
Industrial development, 315 f.; future prospects contingent upon acquisition of sources of raw materials, 321.
Industry, dependence for materials, 315 f.; number of establishments, of employees, proportion of employees, females, 317; value of output of textile manufactures, cotton, 315, silk, wool, 316.
Influence in India, 334.
Iron, imports of; production (pig); resources, 318.
Iron and steel industry, dependence upon imported iron, 318.
Labor supply, proportion females, 317; quality, 321.
Market for American cotton, 316; for manufactures, 335.
Merchant marine, number of ships and tonnage, 314.
Mineral resources, 317.
Mining, number of workers employed in, 317.
Navy, 314.
Policy toward China, 322, 326.
Population, 311, density, 314; proportion engaged in agriculture, 314.
Production: copper, fig. 33, 188, maximum, 270; cotton textiles, 315; iron, 318; silk, 300, fig. 54, 299; silk textiles, 316; wool textiles, 316.
Railways: difficulty of construction; extent, 313.
Russo-Japanese War, 327.
Ship building, 317.
Silk: government aid and direction, 302, 304; production, quantity, 300, fig. 54, 299; superiority of filature thread, 304, for American machine requirements, 300; United States imports, quantity, fig. 54, 299; proportion of imports from Japan, 335.
Special concessions in China, 332.
Strategic position in war, 335.
Territorial expansion, 323, 326 f.
Territorial possessions, 311.
Topography, 313.
Treaty, secret, with Russia, 334.
"Twenty-one Demands" upon China, 330.
United States: exports to Japan (value), fig. 6, 14, of manufactures, fig. 6, 14; proportion in cotton, 316; imports from Japan (value), fig. 6, 14, of copper, fig. 33, 188, of silk, fig. 54, 299.
Water power, 318, location, 318.
Java: area, 343; petroleum production, proportion of output

of Dutch East Indies, 357; population, 343, density, 343; rainfall, 344; sugar, production, 362, room for expansion, 356, yield of cane per acre, 356.
Jute: process of cultivation, harvesting, preparation of fiber, 369 f.; production in India, 362; United States imports, quantity, 372; value, fig. 8, 22; proportion of total imports from India, 369.
Jute textile industry, 370.

"Kaolin," produced in Kiangsi, 291.
Kansu (kän′sōō′), Province of, description, 290.
Kiangsi (kyäng′sē′), Province of, description; products, 291.
Kiangsu (kyäng′sōō′), Province of, description; products, 290.
Kiauchow (kyou′chō), German acquisition, 325, 330, Japanese designs upon, 329; strategic importance, 329.
Korea, 311; acquisition by Japan, 325, 327.
Kowloon (kō′lōōn′), acquired by Great Britain, 325.
Kurile Islands, 312.
Kwangchouwan (kwäng′chō′wän′), leased to France, 325.
Kwangsi (kwäng′sē′), Province of, description; products, 293.
Kwangtung (kwän′tŏŏng′), Province of, description; products, 293.
Kweichow (kwā′chō′), Province of, description, resources, 293.

Labor, in sericulture, 302.
Labor, opposition to industrial improvements, 31.
Labor legislation, in Australia, 383.
Labor supply for Industrial Revolution, afforded by inclosure of common lands, 33.
Labor supply in
  Brazil, lack of competent, for cocoa growing, 156, coffee growing, 139, rubber collecting, 144.
  Chile, agricultural, 206; industrial, quality, 209.
  China, quality, 296.
  East Indies, for rubber plantation, 349.
  France, losses in war, 102.
  Germany, depreciation through effects of inflation of currency, 91.
  Great Britain, cotton textile industry, 48.
  Japan, quality, 321, proportion females, 317.
  Tropics, 248.
Land holdings, size of, in Argentina, 121; Australia, 384; Chile, 206; Cuba, 240; France, 95; Great Britain, 315; India, 366; Japan, 315; Mexico, 277; Porto Rico, 240.
Land holdings, size relative to climate and rainfall, 277, 384.
Large-scale enterprise, *see* Capitalistic enterprise.
Latifundia, in Argentina, 121; in Chile, 206.
Latitude, of Brazil, compared with United States, 135, fig. 20, 135; of China, compared with United States, 298; of Malaysia, 342.
Lead, extent of British commercial and political control over world's production, 44; relative standing of United States, 44.
Leased territory in China, 309, 333.

Legislative reforms proposed for China, 333.
Legumes, rotation with non-leguminous crops, 282.
Liaotung Peninsula (lê ou′tŏŏng′), Japanese designs upon; lease obtained by Russia; strategical importance, 327.
Lime, content in basic slag, 78; in soil of Pampas, 117.
Linseed, *see* Flaxseed.
Livestock, *see* Cattle; Goats; Sheep; Swine.
  Kinds in China, 284.
Loans to China, 309; to Europe, 23.
Locusts in Argentina, 121.
"Loess" soil formation, 289.
London, death rate in, 177; distance to Calcutta, 45, Port Darwin, Rio de Janeiro, 176, Sydney, 45.
Looms, number in cotton textile industry, in Alsace, 1871, 77, present, 103; China, 307; France, hand looms, proportion, 95, concentration of, 95, 101; Great Britain, automatic, 48; Japan, 307; United States, automatic, 48.
Lorraine ("Annexée"), acquisition by Germany, 77; iron industry in 1870, 77; ore production, 78, 103, quality, 107, where smelted, 107; proportion of total German production (pre-war) contributed by, 78; reserves, 103.
Lorraine, French, iron reserves, 103.
Losses of Germany by Treaty of Versailles, 84.
Lota coal mines in Chile, 208.
Lumber in Chile: consumption requirements; dependence upon imports; resources, 207; zone, fig. 32, 185.
Luxemburg, entry into French Customs Union; iron production, 103.
Luxury goods, French production, chief market, 104; market in Argentina, 132, Brazil, 170, Chile, 196, Cuba, 231.
Luzon (lōō′zŏn), major island of the Philippines, 342.

Macao (mä cä′ô), acquired by Portugal, 325.
Machinery, first introduced into manufacture, 28; in British cotton textile industry, compared with American, 48; Japan's manufactures of, 317; imports, 317, proportion from United States, 317.
McIntosh, discovered process of rubber waterproofing, 142.
Malaya: tin production, quantity, fig. 63, 351, proportion of world's output, 351; United States imports from, fig. 63, 351.
Malay Archipelago, extent and location, 342.
Malay Peninsula, acreage of rubber plantations, 348.
MALAYSIA, or East Indies, 339 f., *see* British East Indies, Dutch East Indies, Philippines, Straits Settlements:
  Area, 343; extent, 342; compared with Great Britain and the Netherlands, fig. 58, 340; compared with United States, fig. 59, 342.
  Capital investment, field for American, 357.
  Climate, 343.
  Coconut products, 352 f.: conditions for growing, uses, profitable field for enterprise, 354; United States imports, 348, fig. 8, 22.

MALAYSIA (*continued*)
  Coffee, United States imports from, 348; proportion of total imports, 348.
  Exports, excess to Europe and to United States explained, 345 f.; relation to American export trade of manufactures, 346; major commodities, 347.
  Hemp, Manila: conditions for growing; exports; preparation, qualities and uses of fiber; room for expansion, 354 f.; United States imports, 348.
  Indirect trade with United States, 346.
  Labor supply for rubber plantations, 349.
  Market for consumers' goods, 346; for producers' goods, 347.
  Petroleum: British control of production; importance to Great Britain; output, 1921, 357 f.
  Population, 343; proportion, white, 346.
  Products, major, 347.
  Rainfall, 344.
  Rubber: area of plantations; conditions for growing; introduced from Brazil; labor supply; large-scale enterprise; room for expansion; United States imports, 348 f.
  Standard of living, 346.
  Sugar: labor supply; production of Java, 356; United States imports, 348.
  Tin: British control of, 351; proportion of world output, 351; United States imports, 348.
  Tobacco, 348, 356.
  United States: imports of coconut products, coffee, hemp, rubber, sugar, tin, tobacco, proportion of total imports, 348.
  United States interest in, 344.
Manáos (mä na'ōs), rubber port on Amazon River, 148; climate of, 178.
Manchuria, 286; Japan's designs upon, 328; penetration, fig. 56, 312; population density, fig. 50, 286.
Manchus, administration of China, 323.
Manganese in Brazil, 164; British commercial and political control, extent, over world's production, 44; production of India, proportion of world's output, 362; United States, ores, quality, 164; requirements of, 164.
Manila, climate, 343; entrepôt for United States trade with Far East, 341.
Manila hemp: conditions for growing; exports; preparation of fiber; qualities and uses; room for expansion, 354 f., United States imports, 348.
Manners and customs in Brazil, 178.
Manufactures:
  Exports, from France, Germany, Great Britain, United States, 1890 to 1921, fig. 3, 9; from Japan, proportion of total exports, 315; from United States: proportion of total exports, 11, fig. 4, 10; to Europe, fig. 5, 13, proportion of total exports of manufactures, 18, of total exports to Europe, 17; to North America; to South America, fig. 5, 13; to Argentina, Australasia, Belgium, Brazil, Canada, Chile, China, Cuba, Dutch East Indies, France, Germany, Great Britain, India, Italy,

Manufactures (*continued*)
  Japan, Mexico, Netherlands, Philippines, Spain, fig. 6, 14.
  Imports, into United States, decreasing proportion of total imports, 10, 12, fig. 4, 10; from Europe, decreasing proportion of imports of manufactures, 20, of total imports from Europe, 20.
  Markets, 13 f., fig. 6, 14, *see* Markets for Consumers' and for Producers' goods.
Manufacturing, *see* also under specific country, and under specific industry:
  Capital investment, in Brazil, 174, 208, in Chile, 208; per capita, in Brazil, 175, 208, Chile, 208, United States, 175.
  Employment:
    Number of workers, Chile, 208; Japan, 317; per establishment, Chile, 211; proportion females, Japan, United States, 317.
    Proportion of population engaged in: Australasia, 387, Brazil, 175, France, 5, Germany, 5, United States, 175, 387.
  Location: in China, 295; France, 99 f.
  Power used: in Chile, 208, compared with Rhode Island, 211; per establishment, electric, in France, 96; per hundred workers, in Chile, 211; in United States, 211; per 1000 workers, in United Kingdom, in United States, 59.
  Production, value of: in Australia, 387, Chile, 208, United States, 387, Japan, compared with United States, 317; per establishment, Chile, 211.
  Proportion of silver used in, 268.
Market for
  Agricultural equipment, in Argentina, 132, Australia, 379, Brazil, 174.
  Consumers' goods, in Argentina, 132, Brazil, 170, Chile, 195, China, 280, 306, Cuba, 231, East Indies, 346, India, 372.
  Electric equipment in Brazil, 174, *see* Electricity, opportunity to develop power.
  Producers' goods, in Brazil, 170, Chile, 199, China, 306, Cuba, 230, East Indies, 347, India, 373.
Markets, a factor in the Industrial Revolution, 35.
Maté, yerba, 156.
Materials: dependence upon foreign sources, of Belgium, for iron, 85; Germany, for iron, 85; Great Britain, for cotton, 58, 85, for iron, 57, 85; Japan, for cotton, iron, etc., 315 f.; Switzerland, for cotton, iron, silk, 85; proportion of United States exports, fig. 4, 10, to Europe, to North America, to South America, fig. 5, 13; of imports, 12, fig. 4, 10.
"Matte," copper 40 to 50% pure metal content, 191.
Matto Grosso (mät′o͝o grōs′o͝o), climate, 177; compared with cattle raising region of Argentina, 159.
Mayari (mä yä rē′), Cuba, iron (brown ore) deposits, 229.
Meat: prospective increase of United States import requirements, 128; proportion of Argentine exports consigned to Europe, 131; proportion of exports of New Zealand, 392; relative food value, 127.

Melanesia, 342, footnote.
Merchant marine, of
  France, 314.
  Germany, loss of, 86.
  Great Britain, 314, in middle of 19th century, 69; dependence of American trade upon, 19.
  Japan, 314.
  United States, 314, in middle of 19th century, 69; necessity to develop, 19.
"Mestizo" of Mexico, characteristics, 273; proportion of total population, 275; mestizo government, 275.
Metal content, processes of extraction from copper ore, 188 f.
MEXICO, 258 f., fig. **44**, 259.
  Agricultural regions, 261.
  Agriculture: capitalistic enterprise needed to develop, 262; land holdings, size of, 277; natural resources, 260; products, 261.
  Anti-capitalism, 269, 276.
  Anti-foreignism, 276.
  Anti-white sentiment, 276.
  Area, 216, 261.
  Attitude of government toward American enterprise, 269, 278; toward capitalistic enterprise, 269, 276.
  Capital investments: American, British, French, German, 278.
  Capitalistic enterprise, needed to develop agricultural resources, 262; to exploit mineral wealth, 269.
  Climate, 261, 271, 277.
  Coffee, production and United States imports (quantity), fig. **21**, 136.
  Constitutional reforms, 276.
  Copper, production, 270, fig. **33**, 188; United States imports, fig. **33**, 188; proportion of total imports from, 270.
  Debt, foreign, 278.
  "Democracy" in, 278.
  Dependence on external financial assistance, 277.
  Desert lands, proportion of total area, 261.
  Education, a basic necessity, 279.
  Exports: (value), fig. **47**, 272; to France, Germany, United Kingdom, United States, fig. **47**, 272; major commodities, to United States, 262.
  Fertility of soil, 261.
  Goatskins, quality of, 371.
  Imports: (value), fig. **47**, 272; from France, Germany, United Kingdom, United States, fig. **47**, 272.
  Indian, characteristics, 273.
  Irrigation needed, 261.
  Mestizo, characteristics, 272.
  Mestizo government, resumption of, 275.
  Mexico City, death rate in, 178.
  Mineral resources, character, extent, location, 262.
  Petroleum, importance to Great Britain, to United States; production; United States imports, 262, f.
  Political instability, inherent in character of the people, 272 f.
  Population, composition, 272, 275; concentration, 261, footnote; density, 216.
  Products, 261.
  Rainfall, in northwest, 261, in south, 277.
  Reconstruction under Diaz, 275.
  Resources, 260.
  Silver: production; United States imports, proportion; relation to Europe's monetary

Mexico (*continued*)
  situation; capitalistic enterprise needed, 267 f.
  Sisal: cultivation, uses, 270 f.
  Size of land holdings in relation to rainfall, 277.
  Spanish conquest, 272.
  States of, fig. **44**, 259.
  System of peonage, 276.
  Topography, 260, fig. **45**, 260.
  United States: exports to Mexico (value); of manufactures, fig. **6**, 14; imports from Mexico (value), fig. **6**, 14; major commodities, 262; of coffee, fig. **21**, 136; of copper, fig. **33**, 188; of petroleum, fig. **46**, 263.
Mica production of India, proportion of world's output, 362.
"Middle America," political instability characteristic of, 215; population, 216; total trade of, 218, per capita, 218.
"Middle Kingdom," China proper, 285.
Military strength of Chile, 212.
Milk, relative food value per acre of land, 127.
Minas Geraes (mē′näsh zhā rĭsh′), 159; climate, 177; coffee growing in, 138; diamonds in, 165; manganese in, 164; railway mileage relative to area, 171.
Mindanao (mĭn′dă nä′ō), island of Philippines, 342.
Mineral oil, *see* Petroleum.
Mineral production of the world, extent of British commercial and political control, 44.
Mineral resources of Argentina, 122; Australia, 382; Brazil, 163; Central America, 243; Chile, 185, 195; China, 288, 289, 292, 293, 295, 296, 299; Cuba, 229; India, 362; Japan, 317; Mexico, 262; Santo Domingo, 239; Sumatra, 358; *see also* specific commodities.
Mineral zone of Chile, fig. **32**, 185.
"Minette" iron ore, 77; low metal content, 101; phosphorus content, 77; smelted near mines, 101, 107.
Mining, number of workers employed: Chile, 197; Japan, 317.
Mining prosperity, instability of, 199.
Moa, Cuba, iron (brown ore) deposits in, 229.
Mohammedans in India, 375.
Monazite, in Brazil, 164; in India, relative standing in production, 362; use, 165; world requirements of, 165.
Monetary qualities of gold and silver, 268.
Mongolia, Japan's designs upon, 328; population density in, 286, fig. **50**, 286.
Monroe Doctrine, 254 f., 258; policy contrasted with Great Britain's toward Europe and Japan's toward China, 322.
"Monsoon" winds, 363.
Motor vehicles, number relative to population, in Great Britain, in United States, 264; proportion of petroleum consumed by, in United States, 264.
Mountains in Brazil, 171; Chile, 205, 212; China, 286 f., fig. **49**, 283; Cuba, proportion of area, 229; France, 111; Great Britain, Pennine Range, 36; Japan, 313; Mexico, 260; Philippines, 344; Santo Domingo, 237.
Mule spindle, contrasted with ring spindle, 48, 50, 96, 100; proportion of spindles in Great

Britain, Japan, United States, 49; preferred in France, 96.
Mülhouse, Alsace, potash deposits, 102.
Murrumbidgee irrigation scheme in Australia, 382.
Mutiny, Indian, 374.
Mutton, relative food value, 127.

Nanking, Treaty of, 325.
Nationalism *versus* internationalism, 4.
Naval bases of the United States in the Pacific, 336.
Naval strength of Chile, 212; of Japan, 314.
Negro population of Brazil, 166.
Netherlands, density of population, 5; East Indian possessions, 343, fig. 58, 340; United States exports to (value), fig. 6, 14; of manufactures, fig. 6, 14; imports from (value), fig. 6, 14.
Newcomen's "fire engine," 30.
New Guinea, or Papua, 342, 343.
New York, distance to Australia, 390; to Rio de Janeiro, 176.
NEW ZEALAND, 391 f.
  Area: proportion forested; proportion suitable for agriculture, 392.
  Cattle, number of head, 392.
  Climate, 392.
  Exports: (value), fig. 75, 392; to Australia, United Kingdom, United States, fig. 75, 392; major commodities, 392; butter and cheese, hides and skins, meat, wool, proportion of total exports, 392.
  Imports: (value), 392, fig. 75, 392; from Australia, United Kingdom, United States, fig. 75, 392; proportion from Australia, Great Britain, United States, 392.
  Industry in, 391.
  Population, 392.
  Sheep, number of head, 392, fig. 73, 385; in proportion to population, 392.
  Sheepskins, United States imports (pieces), fig. 73, 385.
Niagara Falls, water power, 62, 173.
Nicaragua, area, 216.
Nickel, in Cuba, 230; extent of British commercial and political control over world's production, 44.
Nitrate zone of Chile, 186, 205, fig. 32, 185; provinces acquired by Chile, 187.
Nitrates:
  Ammonium sulphate, source of, 200; use by Germany, 103.
  Atmosphere, source of, by fixation processes, 200.
  Fixation processes, 200.
  Leguminous crops (nitrogen in bacteria), source of, 282.
  Organic sources of supply, 200, 282.
  Sodium deposits of Chile, 186 f.
  Use as fertilizer, 186; for explosives, 200.
Nitrogen content of soil of Pampas, 117.
Non-interference, policy of United States, 257.
North region of China, provinces of, 287 f.
Norway, area compared with Europe and other countries of Europe, fig. 7, 15.

Oats:
  Food value, relative, per acre of land required, 127.
  Production per 1000 persons in Belgium, Germany, Switzerland, United Kingdom, 86.

OATS (*continued*)
  Proportion of world's exports supplied by United States, 8.
  Yield per acre in Germany, 79.
Occupation, distribution of population by, in France, 5; Germany, 5, in 1870, 76.
Ocean transportation, advantage, 35.
O'Higgins (ȯ ē′gė̄ns), mineral province in Chile, 194.
Oil, coconut, United States imports, 353; proportion from Dutch East Indies and the Philippines, 354; use of, 353.
Oil, mineral, *see* Petroleum.
Oil, selective attraction for metals, 189.
Oil bunkering stations in Caribbean, importance to United States, 266.
"Open Door," policy of, 326.
Opium, British smuggling into China, 324.
Organic sources of nitrogen, 200, 283.
Oriente (ō rė̄ ĕn′tā), Province of, cocoa and coffee region in Cuba, 229.
Oxidation, process of fixation of atmospheric nitrogen, 201.

Pampas, description, 114.
Panama Canal, effect upon Chile: as a market, 195; exports of raw materials, 210; imports of manufactures, 210; prospects as a copper producer, 188; iron production, 195; relation to Monroe Doctrine, 256.
Paper currency in Brazil, 179; in Chile, 213.
Paper, United States imports, value, fig. 8, 22.
Papua (New Guinea), area, population, 343.
Para (pä rä′), rubber port of Brazil, 148; climate, 178; death rate, 178.
Parahyba (pä′rä ē′bä), cotton-growing state in Brazil, 162.
Paraná (pä′rä nä′), state, 159, 160; yerba maté grown in, 157.
Paris, death rate, 177.
Patagonia, sheep raising in, 131.
Peanuts, relative food value per acre, 127.
Peonage system in Mexico, 276.
Pernambuco, cotton-growing state in Brazil, 162.
Peru, conquest of, 184; copper production, 188; currency, 179.
Pescadōres (pĕs cȧ dō′rĕs), acquired by Japan, 325.
Petroleum:
  Advantages as fuel, 65; for ships, 65, 265; for smelting copper, 192.
  British commercial and political control, extent, over world's production, 44; over world's resources, 65.
  Dependence of United States upon, 263.
  Effect on British shipping situation, 66.
  Efficiency, compared with coal, 65; in copper smelting, compare coal, 192.
  Importance, in relation to trade and shipping, 265, 357.
  Motor vehicles, proportion consumed by, 264.
  Production, fig. 46, 263; of Dutch East Indies, 357, fig. 46, 263; British control of, 357, proportion in Borneo, in Java, in Sumatra, 357; of India, proportion of world's output, 362; of Mexico, 263, fig. 46, 263, proportion of world's output, 263; of Russia, fig. 46,

Petroleum (*continued*)
    263; of United States, fig. 46, 263, proportion of world's output, 65, 263.
  Reserves, of United States, diminishing, 264; of world, control by Great Britain, 65.
  United States: consumption, proportion of world's output, 263; imports, quantity, fig. 46, 263, from Mexico, fig. 46, 263; value, fig. 8, 22.
  Uses, in peace; in war, 264.
PHILIPPINES, 339 f.
  Acquired by United States, 339.
  Area, 343.
  Climate, 343.
  Coconut products, 354; United States imports of coconut oil, copra, proportion from, 354.
  Distance, to Yokohama, 341.
  Entrepôt, for United States trade with Far East, 341.
  Exports: (value), fig. 60, 345; to China, Japan, United Kingdom, fig. 60, 345, to United States, 344, fig. 60, 345; of manila hemp, 355; of sugar, proportion of total exports, 356; of tobacco, proportion taken by United States, 356.
  Geographic position, 342.
  Importance to United States, economic, strategic, 341.
  Imports: (value), fig. 60, 345; from China, Japan, United Kingdom, fig. 60, 345, from United States, 344, fig. 60, 345.
  Manila hemp, 354 f.; United States imports, 348.
  Population, 343; proportion white, 346.
  Rainfall, 344.
  Self-government, question of, 340.
  Strategic importance to United States, 341.
  Sugar, proportion of total exports, 356; production, fig. 38, 221.
  United States: attitude towards, 341; exports to Philippines (value), fig. 6, 14, of manufactures, fig. 6, 14; imports from Philippines (value), fig. 6, 14; of coconut oil, of copra; proportion from, 354; of sugar, fig. 38, 221; of tobacco, proportion of total exports, 356.
Phosphates: from African colonies, used in France, 102; recovery from organic refuse, in China, 283; waste in organic refuse, in United States, 283.
Phosphoric acid content, of basic slag, 78; of soil of Pampas, 117.
Pinar del Rio (pē när′ dĕl rē′ō), tobacco region in Cuba, 228.
Pizarro, Francisco, 184.
Plantation rubber, advantages in production, 149.
Poland, area compared with Europe and other European nations, fig. 7, 15; grain lands, restored, 84.
Policy, of Great Britain toward India, 373, toward Near East, toward Russia, 375, toward private enterprise abroad, 267; of United States, toward Caribbean region, Central America, 253 f., China, 325, Philippines, 341, private enterprise abroad, 254.
Political apathy in India, 376.
Political influence by private enterprise in Central America, 249.
Political instability, characteristic of "Middle America," 215; cause of, 251, 272; in Central

America, 242, 251; in Cuba, 219; in Haiti, 233; in Mexico, 272 f.; Santo Domingo, 234.

Political stability of Chile, 212; of Costa Rica, 252; relation to foreign trade, 218.

Population: of Argentina, 120, potential, 120; Australia, 379; Brazil, 166; British Empire, 43; Ceylon, 343; Chile, 195, in mineral provinces, 197; China, 280, China proper, 286; Cuba, 220; Dutch East Indies, 343; Federated Malay States, 343; France, fig. 2, 7; French colonial possessions, 112; Germany, fig. 2, 7; Great Britain, fig. 2, 7; Haiti, Republic of, 233; India, 361; Japan, 311; Japanese Empire, 311; Java, 343; Malaysia, 343; "Middle America," 216; New Zealand, 392; North Borneo and Sarawak, 343; Papua, 343; Philippines, 343; Porto Rico, 240; Protected Malay States, 343; Santo Domingo, 233; Straits Settlements, 343; United States, fig. 2, 7.

Population, composition: of Australia, homogeneity, 379; Chile, 195; Costa Rica, homogeneity, 252; Cuba, proportion white, 231; Dutch East Indies, proportion white, 346; East Indies, 346; Haiti, Republic of, 233; Mexico, 275; Philippines, proportion white, 346; Porto Rico, 240; Santo Domingo, 234; Straits Settlements, proportion white, 346.

Population, concentration: in Argentina, 120; Australia, 380, fig. 71, 380; Brazil, 170; Central America, 243; Chile, 205; India, 365; Mexico, 261, footnote.

Population, density: in Argentina, 216, rural, 120; Australia, 379; Belgium, 5; Buenos Aires, Province of, 120; Central America, 216; Chengtu Plateau, 291; China, provinces, fig. 50, 286; Cordoba, 120; Cuba, 220, 240; England, 5; France, 5; Germany, 5, rural, 5, urban, 5; Great Britain, 314; Japan, 314; Java, 343; Mexico, 216; "Middle America," 216; Mongolia, 286; Netherlands, 5; Nord, Departement du, 99; Porto Rico, 240; Shantung, 281; Tibet, 286; Turkestan, 286; United States, 216; West Indies, 216.

Population, distribution: Australia, fig. 71, 380; Brazil, compared with United States in 1810, 170; China, fig. 50, 286; India, fig. 66, 364; South America, fig. 30, 169.

Population, distribution by occupation: in France, 5; Germany, 5, in 1870, 76.

Population, foreign, proportion of total of United States, 16.

Population, growth: in England, 8; France, fig. 2, 7; Germany, 18, fig. 2, 7; Great Britain, 18, fig. 2, 7; United States, 18, fig. 2, 7, rural, fig. 1, 6, urban, fig. 1, 6; facilitated by promotion of commerce and industry, 5, by separation of industry from agriculture, 40; rate of increase, in Argentina, Brazil, United States, 168.

Population, proportion engaged in

agriculture, in France, 94, Germany, 5, 94, Great Britain, 94, 314, India, 361, Japan, 314, United States, 94; in commerce, France, Germany, 5; in industry, in Australia, 387, Brazil, 175, France, 5, Germany, 5, United States, 175, 387.
Population, proportional rural, in France, Germany, United States, 94.
Pork, relative food value, 127.
Port Arthur, strategical importance, 328.
Port of Havana, 232.
Porto Rico, 240 f.
  Agriculture, size of land holdings, 240.
  Area, 240.
  Economic development, 240.
  Exhaustion of soil, 241.
  Population, composition, density, 240.
  Sugar production, fig. 38, 221; exports in sugar, 240; sugar content of cane, 241; wasteful methods of farming, 241.
Ports, factor in Industrial Revolution; of Great Britain, of United States, per square mile of area, 36.
Possessions, of Japan, 311; West Indian, of United States, 216.
Potash:
  Basis of German heavy chemical industry, 81.
  Consumption in Germany, 81.
  Content of soil, of Pampas, 117; of Central America, 242.
  Deposits in Alsace, extent, quality, 102; France's recovery of, 102; in Saxony, extent, 81.
  Monopoly (pre-war) of Germany, 79, loss of, 84.
  Production in Germany, 82.
  Recovery from organic refuse in China, 283.
  Waste in organic refuse in United States, 283.
Potatoes, food value, relative, per acre, 127, 246, production per 1000 persons, in Belgium, Germany, Switzerland, United Kingdom, 86; yield per acre in Germany, 79.
Poultry, rate of reproduction, 285.
Power used: in Chile, 208, compared with Rhode Island, 211, per 100 workers, 211; in France, electric, 96; per establishment, 96; in Great Britain, per 1000 workers, 59; in United States, relative to number of workers, 59.
Price of coal, in France, Germany, United States, 97; Japan's coal compared with United States, 317; Westphalian, 97, compared with Sarre, 106.
Prices, effect of currency inflation upon, 90.
Producers' goods, market for, in Brazil, 170 f.; Chile, 199; China, 306; Cuba, 230; East Indies, 347 f., India, 373.
Production, economies of, practiced in China, 282 f.
Production, *see* specific commodities: Artificial silk, barley, butter, coal, cocoa, coffee, coke, copper, copra, corn, cotton, cotton textiles, flax, flaxseed, gold, iron, jute, lead, linseed (*see* flaxseed), monazite, nitrates, oats, petroleum, potash, potatoes, rapeseed, rice, rubber, rye, silk, artificial and natural, silk textiles, silver, sugar, beet and cane, sugar beets, sugar cane, tea, tin,

tobacco, wheat, wool, wool textiles, zinc.
Productive efficiency in cotton textile industry, Great Britain and United States, 48.
Products: Argentina, 118; Australia, 388; Brazil, 134 f., 158, 162; British Empire, 43; Central America, 243; Chile, 185 f., 203; China, 288 f.; Cuba, 228; India, 369; Japan, 315 f.; Malaysia, 348; Mexico, 261 f.; New Zealand, 392; Philippines, 358.
Products of coconut tree, 352.
Profits from investments in Brazil, 182; China, 307.
Progresso (prŏ grā'sō), sisal growing region of Yucatan, Mexico, 271.
Property, *see* Land holdings.
Protected Malay States, area, population, 343.
Provincial governors in China, 310.
Prussia, growth of, 71.
Public improvements in Chile, 198.
Purchasing power, decline in Europe's, 19.

"Quality production," French specialization upon, 95; German economic situation requires, 88 f.; Great Britain, trend toward, 51, 55, 88; in Switzerland, 89.
"Quantity production," Germany, economic situation requires reversion from, 88 f.; Great Britain, reversion from, 51, 55, 57; United States, 60.

Rabbit skins, proportion of United States imports from Australia, 381.
Rabbits in Australia, 381.
Radicalism in India, 375.
Rapeseed, India, 362, proportion of world's output, 361.
Railway construction in Central America, risks, 249; in China, hindered by "squeeze," 309; in England, during the Industrial Revolution, 37.
Railways, government ownership, in Australia, 386; in Chile, 198; in Germany, 74.
Railways, gradient, in Brazil; general engineering practice, 172.
Railways, in Argentina, 119; in Brazil, 171; in Central America, 249; in Chile, 198; in China, 282, 307; in India, 364; in Japan, 313; in Santo Domingo, 239; in United States, 1870, 281.
Rainfall, in Argentina, 381, fig. 74, 389; in Australia, 381, fig. 74, 389; India, 363; Java, 344; Malaysia, 344; Mexico, 261, 277; Philippines, 344; Santo Domingo, 239.
Readjustment, problem of economic, in France, 104, in Germany, 88.
Reciprocity agreement between Cuba and United States, 223.
Redemption of paper currency in Brazil, 180; Chile, 213; Germany, 90.
Reëxports from Europe to United States, increasing proportion, 20; injurious to United States export trade, 20; from Great Britain to United States, fig. 9, 27, increasing proportion, 26, in relation to Great Britain's ability to pay for her purchases, 26.
Refining, electrolytic, 193.
Reichsbank, German government control of industry through, 74.

Reichstag, 72.
Relief to famine-stricken in India, 365.
Religious unrest in India, 376.
Reserves, *see* Mineral resources.
Resins in Brazil, 158.
Revenue, of Brazil, proportion from import tariffs, 180, 181; of Chile from nitrate exports, 197.
Reverberatory furnace, advantages, description, 191.
Revolutions in Central America, 251.
Rice:
  Adapted to tropics, 163.
  Exports from India, proportion of total, 363.
  Produced, in Brazil, 163; in China, 290, 291, 292, 362; India, 362, relative standing, 361.
  Yield per acre, in Chengtu Plateau, 292; Hawaii, 315; India, 315; Italy, 315; Japan, 315; compared with corn and wheat, 285.
Rights of China, 333.
Ring spindle, compared with mule, 48, 50, 96, 100; proportion, in Japan, Great Britain, United States, 49.
Rio de Janeiro (rē′ō dā zhȧ nā′rō), climate, 177; death rate, 177; distance from London, from New York, 176; harbor of, 171; sanitation in, 177.
Rio de Janeiro, State, coffee raised in, 138; extent of railways in proportion to area, 171.
Rio Grande do Norte, cotton-growing state in Brazil, 162.
Rio Grande do Sul (rē′ō grän′dā do͝o so͞ol′), cattle, number of head in, 159; railways, extent in proportion to area, 171; yerba maté grown in, 157.
Rio Negro, southern boundary of Pampas, 114.
Rio Salado (rē′ō sä lä′ thō), 114.
Risk, deterrent upon productive enterprise, 87, upon trade with Germany, 91; in banana industry, 247 f.; railway construction in Central America, 249; in trade and investment in Chile, 213; in trade with Cuba, 232.
Riu-Kiu Islands, acquired by Japan, 325.
Road building in England during Industrial Revolution, 36.
Roads in Central America, 249.
Rotation of crops in China, 282.
Royal Meadow of Santo Domingo, area, fertility, 238.
Rubber:
  Advantage to United States of Brazil as source of, 151.
  Area, Amazon region, 144; Ceylon, Dutch East Indies, Malay Peninsula, plantation acreage, 348.
  Capitalistic enterprise, in East Indian rubber growing, 149, 349; opportunity for, in Brazilian rubber production, 150.
  Conditions for growing, 349.
  Cultivation introduced into Ceylon, 149, 348.
  Expansion, room for, in Brazil, 144; in Malaysia, 349.
  Exports from East Indies, 149.
  History of, 142.
  Labor, in Brazil, lack of, 144; in East Indies, 349.
  Plantation production, advantages of, 149.
  Process of collecting latex, 146; of curing, 147.
  Production, 1900 to 1921, fig. **24**,

Rubber (*continued*)
  143, fig. 61, 347; in Brazil, British East Indies, Dutch East Indies, fig. 61, 347.
  Quality of Brazilian, 147, 149; of Eastern plantation, 149.
  Remedies for disadvantages of Amazon production, 149.
  Species of rubber trees, 146.
  Trucking system in Amazon region, 148.
  United States: consumption, proportion of world's output, 144; imports, quantity, 1900 to 1921, fig. 24, 143 (U. S. statistical abstract), annual average 1919–21, fig. 61, 347 (statistics from International Institute of Agriculture); from Brazil, British East Indies, Dutch East Indies, Straits Settlements, fig. 61, 347; value, 348, fig. 8, 22; from East Indies, 348.
  Yield of latex per tree, 149.
Ruhr, occupation by French, 109.
Rural population: growth in United States, fig. 1, 6; proportion of total population in France, Germany, United States, 94.
Russia, British policy toward, affected by India, 375; production, petroleum, fig. 46, 263, wheat, 362; secret treaty with Japan, 334.
Russia in Europe, number of sheep, 362, fig. 73, 385.
Russo-Japanese War, 327.
Rye, production per 1000 persons in Belgium, Germany, Switzerland, 86; yield per acre in Germany, 79.

Saar, *see* Sarre.
St. Thome and Prince, production of cocoa, fig. 26, 153.
Sakhalien (sȧ'kȧ̱ lyēn'), 311; Japan's designs upon northern half, 329.
Salvador, area, 216.
Samana Bay (sä'mä nä'), description, 238.
Sanitation, in Cuba, 230; Rio de Janeiro, 177; in the tropics, 248.
Santiago (sän'tē̆ ä'gō), capital of Chile, 206; death rate, 197; province in Chile, 205.
Santo Domingo, 233 f.
  Area, 233, of arable land, 237.
  Capital investment, opportunity for, 239.
  Climate, 239.
  Cocoa production, 236, fig. 26, 153.
  Debt, foreign, 234.
  Illiteracy, 239.
  Intervention by United States, 235.
  Mineral resources of, 239.
  Political instability, 234.
  Population of, 233; composition, 234.
  Railways, extent, 239.
  Sugar: cane yield per acre, 237; production, 236.
  Tobacco production, 236.
  Trade, per capita, 236.
  United States imports of cocoa, fig. 26, 153.
São Paulo (sown pou'lo͞o), city: death rate in, 177; state: coffee growing in, 138; railways, extent in proportion to area, 171.
Sarawak (sä rä'wäk) and North Borneo, area and population, 343.
Sarre coal: acquisition by France, 103; compare Westphalian, 106; distance from tidewater, 106; efficiency, 106; iron smelting, proportion with

Westphalian quality, 106, 108; price, compared with Westphalian, 106; production, 104, 105; quality, 106; reserves, 103, 105; reserves of coking coal, 106, sufficient to smelt minette reserves, 110.
Schools, German commercial, 76.
Seibo plain, Santo Domingo, area, 238.
Self-government in India, 376.
Sericulture, *see* Silk.
Sesamum, proportion of total exports of China, 298.
Sete Quedas Falls (sā tĕ kå′däsh), potential hydro-electric power, 173.
Sewage, nitrogen, phosphate, potash content of, 283.
Shansi (shän′sē′), Province of, description, resources, 289.
Shantung (shän′tŏŏng′), Province of, description, products; resources, 288; Japan's designs upon, 329; population density, 281.
Sheep, number of head in:
  Argentina, 118, 362, fig. **73**, 385; relative to area, to population, 203.
  Australia, 362, 388, fig. **73**, 385; relative to population, 388, 392.
  Belgium, relative to population, 86.
  British Empire, proportion of world, 43.
  Chile, 203; relative to area, to population, 203.
  Germany, relative to population, 86.
  India, 362, fig. **73**, 385; relative standing, 361.
  New Zealand, 392, fig. **73**, 385; relative to population, 392.
  Russia in Europe, 362, fig. **73**, 385.
  South Africa, fig. **73**, 385.
  Switzerland, relative to population, 86.
  United Kingdom, fig. **73**, 385, relative to population, 86.
  United States, 362, fig. **73**, 385; relative standing, 125.
Sheep raising in Argentina; in Patagonia; in Tierra del Fuego; in United States, 131; major sheep-raising countries, fig. **73**, 385.
Sheepskins, United States imports, fig. **73**, 385; from Argentina, Australia, India, New Zealand, South Africa, United Kingdom, fig. **73**, 385.
Shellac, cultivation of lac in India; description of process; United States imports, quantity; uses, 371 f.
Shensi (shĕn′sē′), Province of, description; potential fertility, 290.
Shipbuilding in Japan, 317.
Shipping: agreement of Germany with American interests, 86; dependence of United States upon British, 19; of France compared with Germany in 1870, 94; Port of Havana, 232; compared with Maryland customs district, Massachusetts customs district, Philadelphia customs district, tonnage and value, 232; *see* Merchant marine.
Siberia, Japan's strategy in, 329.
Si-Kiang (sē′kyäng′), Canton or West River, 287.
Sikkim, acquisition by Great Britain, 325.
Silk, artificial, description of process of manufacture; pro-

duction in United States; uses, 305 f.

Silk, natural, 299 f.
  Basis for trade between China and United States, 306.
  Conditions suitable in China, 299, 302.
  Description of processes, 300 f.
  Export, major from Japan, 315; proportion of total exports from China, 298.
  Government aid and direction in Japan, 304.
  Improvement in China, steps toward, 304.
  Produced in Kiangsu, 290; in Kwantung, 293.
  Production, fig. 54, 299; of China, 300, fig. 54, 299; of Italy, fig. 54, 299; of Japan, 300, fig. 54, 299.
  Quality of Chinese, 300, of Japanese, 300, 304.
  "Seed" culture, in Japan, 302.
  United States consumption, 300; imports, quantity, fig. 55, 301, from China, Japan, fig. 54, 299; value, fig. 8, 22.

Silk textile industry, of France, location, 99; of Japan, value of output, 316; of Switzerland, dependence for raw silk, 85; of United States, value of output, 316.

Silver:
  British commercial and political control over production, extent of, 44.
  Monetary qualities, 268.
  Production, in Chile, proportion of world's output, 185; in Mexico, proportion of world's output, 268; in United States, 268.
  Proportion used for manufacturing, decline, 268
  Relation to Europe's monetary situation, 267.
  United States imports, proportion from Mexico, 269.
  Uses, 268.

Singapore, entrepôt for East Indies, 344; tin smelting center, 351.

Singkep, tin in, 351.

Sisal, cultivation; uses, 270.

Size of land holdings, *see* Land holdings.

Smelting: copper, process of, 191, efficiency of petroleum compared with coal, 192; iron, Lorraine, near mines, 107, efficiency of Sarre coal, 106.

Socialism in Australia, 383; hindrance to agricultural progress, 384.

Sodium nitrates, *see* Nitrates.

Soil, fertility, in Argentina, 117; Brazil, 139, 160; Central America, 242; China, 289, 292, 293; France, 102; Germany, 79; Mexico, 261; New Zealand, 392; Porto Rico, 229; Santo Domingo, 237.

South Africa, number of sheep, fig. 73, 385; United States imports of sheepskins from (pieces), fig. 73, 385; of wool, proportion, 390.

South America, countries of, fig. 14, 115; population, distribution, fig. 30, 169; topography, fig. 15, 116.

South German Confederation, 71.

Soy bean, food value of, 285.

Spain, potential water power, 110; United States exports to Spain (value); of manufactures, fig. 6, 14; imports from Spain (value), fig. 6, 14.

"Spheres of interest" in China, 309, 333.

Spindles:
  Comparison of mule and ring, 48, 50, 96, 100.
  Number, in Alsace in 1871, 77, in 1921, 103, in wool textile industry, 103; in China, 307; in Japan, 49, 307, 316; in Germany in 1870, 77; in Great Britain, compared with Germany, 50, with United States, 49, proportion of world's, 49.
  Proportion, ring spindles, in Japan, Great Britain, United States, 49.
"Squeeze" an obstacle to China's progress, 308.
Stability, political, of Chile, 212; Costa Rica, 252; relation to foreign trade, 218.
Stages of a cattle-raising country, 126.
Standard of goods exported, maintained by requirements of domestic market, 59.
Standard of living in Argentina, 132; Australia, 379; Brazil, 170; Chile, 196; Cuba, 231; India, 372; Malaysia, 346; Santo Domingo, 239.
Standardization, incompatible with custom production, 170.
Stassfurt, potash deposits in, 81.
States of Brazil, fig. 22, 138; of Mexico, fig. 44, 259.
Steel manufacturing in China, 297; in India, 372; *see also* Iron and steel industry.
Straits Settlements: area, population, trade balance, United States exports to, imports from, 343 f.; rubber production and United States imports from, fig. 61, 347.
Strategic position of Japan in war with United States, 335.
Sugar, beet: 222 f.; production in United States, 223; per 1000 persons in Belgium, Germany, Switzerland, 86.
Sugar, cane:
  Area in Cuba, 229.
  By-products, possible utilization of, 228.
  Cane yield, *see* Sugar, cane; Yield.
  "Centrals" in Cuba, 226.
  Climatic requirements for growing, 225.
  Consumption in United States, per capita, 221, proportion of world's output, 220.
  Content, sugar, per acre, in Cuba, in Porto Rico, 241.
  Cultivation and harvesting, 224; wasteful methods in Porto Rico, 241.
  Description, 224.
  Districts, sugar growing, of Cuba, fig. 40, 229.
  Exports, proportion of total exports, from Cuba, 228, Philippines, 356, Porto Rico, 240.
  Food value of, 220.
  History of, 220.
  Process of milling, 226.
  Production, fig. 38, 221; of Australia, 391; in Brazil, 163, fig. 38, 221; Cuba, 221, 356, 362, fig. 38, 221, from 1850 to 1921, fig. 39, 222, proportion of world's output, 221; Dutch East Indies, fig. 38, 221; Hawaii, fig. 38, 221; India, 356, 362, fig. 38, 221, relative standing, 361; Java, 356; Philippines, fig. 38, 221; Porto Rico, fig. 38, 221; Santo Domingo, 236.
  Room for expansion in Cuba, 228; Java, 356; Santo Domingo, 237.

Sugar, cane (*continued*)
  Size of sugar land holdings in Cuba, in Porto Rico, 240.
  Tariff reduction on imports from Cuba into United States, 223.
  United States: consumption, per capita, 221, proportion of world's output, 220; imports, quantity, fig. 38, 221; from Cuba, Dutch East Indies, Philippines, fig. 38, 221; value, 348, fig. 8, 22; from East Indies, 348; proportion of total imports, 221, of imports of foodstuffs, 8, of sugar imports supplied by Cuba, 221.
  Yield, of cane per acre, in Cuba, 237, 241, 356; in Java, 356; in Porto Rico, 241; in Santo Domingo, 237; of sugar content per acre in Cuba, in Porto Rico, 241.
Sumatra (sōō mä'trä), island in the Dutch East Indies, 342; forest products, mineral resources, 358; proportion of petroleum production of Dutch East Indies, 357.
"Swadeshi" movement, 376.
Sweden, potential water power, 110.
Swine, rate of increase, 284; food value of pork, 284, relative, per acre of land, 127; number per 1000 persons in Belgium, Germany, Switzerland, United Kingdom, 86.
Switzerland: imports of foodstuffs per capita, 85; number of cattle, goats, sheep, swine per 1000 persons, 86; potential water power, 110; production per 1000 persons of barley, oats, potatoes, rye, sugar beets, wheat, 86; silk textile industry, dependence for raw silk, 85.
Szechuan (sä'chwän'), Province of, description, products, resources, 291.

Taiping Rebellion, 293.
Taiwan (tī'wän') or Formosa, 311.
Talcahuano, harbor of Chile, 198.
Tarapaca (tä'rä pä cä'), nitrate province in Chile, 187.
Tariff:
  Brazil, policy, 174; proportion of revenue from, 180, 181; reduction of duties upon certain imports from United States, 176.
  British Imperial, 377.
  Chile, 210.
  China, foreign administration of, 310; revision, 333.
  Germany, employment to promote trade, 75.
Tariff union of France, entry of Luxemburg, 103; of Germany, 71.
Taxation of farmers in Australia, 386.
Tea:
  Consumption per capita of Australasia, Great Britain, United States, 299.
  Exports, of China, proportion of exports, 298; of India, proportion of exports, 369.
  Produced in Anhwei, 290, in Kiangsi, 291, 292.
  Production of India, Ceylon, 362; proportion of world's supply, 361.
Temperature, in Amazon region, 149, 178; Argentina, 381, fig. 74, 389; Australia, 381, fig. 74, 389; Brazil, 149, 177, 178; East Indies, 343.
Territorial acquisitions of Japan, 327 f., fig. 56, 312; policy of, 322, 326 f.

Texas, area (262,398 square miles).
Textile industry: in Brazil, capital investment, 175; Chile, capital investment, 211; China, 307; France, 99; Germany, 82; Great Britain, 29 f., 46 f.; India, 372; Japan, 315 f.; United States, 50; *see* Cotton textile industry, Silk textile industry, Wool textile industry.
Thomas, with Gilchrist, discovered basic process for making steel, 78.
Thorium nitrate, from monazite, 165.
Tibet, population density, 286.
Tierra del Fuego, sheep raising in, 131.
Timber, in Brazil, 158; in Chekiang, 292; in Chile, 207.
Tin:
  Bolivian, 352.
  British control, commercial and political, 44, 350.
  Deposits in Australia, 383; Bolivia, 352, obstacles to exploitation, quality of ores, 352; China, 294, 296; Great Britain, 350; Malaysia: Dutch East Indies, Malaya, Siam, 351; United States, 350.
  Production, fig. 63, 351; of Bolivia, China, Dutch East Indies, Malaya, fig. 63, 351; proportion of world's output, by China, 296, Dutch East Indies, Malaya, 351.
  Smelting: excess, capacity, 352; extent of British control, 350; opportunity for American enterprise, 351; Singapore, world's smelting center, 351.
  United States: consumption, proportion of world's output, 350; imports, quantity, fig. 63, 351, from Bolivia, China, Dutch East Indies, Malaya, fig. 63, 351; value, 348, fig. 8, 22, from East Indies, 348.
  Uses, 349.
Tin plate, proportion of tin used for, 349; substitutes for, 349; United States consumption, 1899 to 1920, fig. 62, 350.
Tobacco: of Cuba, 228; of Dutch East Indies, distinctive qualities, 356; India, relative standing, 361; Philippines, proportion of exports consigned to United States, 356; Santo Domingo, 236; United States imports, value, 348, fig. 8, 22, from East Indies, 348.
Tongkin, acquired by France, 325.
Tonnage:
  Merchant marine of Great Britain, 314, middle of 19th century, 69; Japan, 314; United States, 314, middle of 19th century, 69.
  Shipping of customs districts of Maryland, Massachusetts, Philadelphia; of Port of Havana, 232.
Topography: of Central America, fig. 43, 252; China, fig. 51, 287; England, in relation to her industrial development, 36; Island of Haiti, 237; Japan, 313; Mexico, 260, fig. 45, 260; South America, fig. 15, 116.
Toscanelli's map of the world (part), showing Brazil as an island off the coast of Europe, fig. 27, 158.
Trade, foreign, a factor of progress, 4 f.; affected by fluctuating exchange value of currency, 91, 213, by political instability, 218; bearing upon foreign capital investment, 21 f.;

between countries of Europe, 16; between countries differing in climate, customs, and civilization, 136; between industrial competitors, 15 f.

Trade, foreign, of Argentina, 218, fig. 17, 123, per capita, 218; Australia, fig. 70, 378; Brazil, fig. 31, 175, per capita, 218; Central America, per capita, 218; Chile, fig. 34, 196, per capita, 218; China, fig. 53, 298; Cuba, fig. 41, 231, per capita, 218, 236; Haiti, Island of, compared with Cuba, 234; Haiti, Republic of, compared with Santo Domingo, 234; India, fig. 68, 369; Japan, fig. 57, 316; Mexico, fig. 47, 272, Middle America, 218, per capita, 218; New Zealand, 392, fig. 75, 392; Philippines, fig. 62, 350; Santo Domingo, per capita, 236; United States, *see* United States: Trade; West Indies, per capita, 218.

Treaties of China, publication of, 333.

Treaty of the nine powers, 333.

Treaty of Versailles, 83; effect upon increasability of factors of production of Germany, 88.

Trinidad and Tobago, production and United States imports (quantity), of cocoa, fig. 26, 153.

Tropical agriculture, capitalistic enterprise in, risks, 247.

Tropical possessions of British Empire, 43.

Tropical products in Australia, 391.

Tropics, conquest of, 244; labor in, 248; sanitation in, 248.

Trucking system in Amazon rubber region, 147 f.

Tungsten: British commercial and political control over production, 44; in China, 296; production of India, proportion of world's output, 362.

Turkestan, Chinese population density, 286.

"Twenty-one demands" of Japan, 330.

Union control in British cotton textile industry, 48.

United Kingdom, *see* Great Britain.

UNITED STATES:
  Agriculture:
    Acreage of hay, 127.
    Livestock, *see* Cattle, Sheep.
    Production, value of, 387.
    Proportion of population engaged in, 94.
  Area, 3.
  Automobiles in, 264.
  Capital investments, in Argentine enterprise, 124, meat packing, proportion, 131; in Brazil, 176; in Chilean copper mines, proportion, 194, iron mines, 195; in Cuban sugar production, effect upon output, 224; in Mexico, 278, silver mines, 269.
  Cattle, number of head, 362, fig. 19, 128; compare Argentina, 125; proportion of world's stock, 43.
  Cattle ranging, area required per head, 243.
  Climatic complement of Brazil, 136, fig. 20, 135.
  Constitutional relations with Cuba, 219.
  Consumption, of
    Bananas, per capita, 247.
    Coal, per capita, 67, rate of increase, 67.
    Coffee, per capita of adult population, 137.

United States (*continued*)
    Corn, per capita, 363.
    Cotton, per capita, 50; of cotton textile industry, 50.
    Iron, per capita, rate of increase, 57.
    Manganese, requirements, 164.
    Silk, 300, rate of increase, 300.
    Sugar, per capita, 221, world's output, 220.
    Tea, per capita, 299.
    Tin, proportion of world's output, 350.
    Tin plate, 1899 to 1920, fig. 62, 350.
    Wool, requirements, determined by population, 390.
  Debt, foreign, in 1868, 181.
  Development, economic, trend of, 10.
  Diplomacy in Caribbean region, 256.
  Distance:
    Carriage of iron ore to coal, of steel-finishing industries to tidewater, 111.
    New York to Australia, 390, to Rio de Janeiro, 176.
  Eastern Problem, 335 f.
  Economic importance of Philippines, 341.
  Exports:
    Commodities: composition, fig. 4, 10, fig. 5, 13; copper, 194; corn, proportion of world's exports, 8; cotton, proportion of world's exports, 8; proportion to Japan, 316; cotton piece goods, to Argentina, 124; FOODSTUFFS, proportion of total, 8, fig. 4, 10; to Europe, fig. 5, 13; proportion of total exports to Europe, 12; iron and steel manufactures, increase in proportion to total exports, 60; MANUFACTURES, 1890 to 1921, fig. 3, 9; injured by indirect trade, 21, 346; proportion of total exports, 10, 11, fig. 4, 10, of exports to Europe, 17; to Europe, fig. 5, 13; proportion of total exports of manufactures, 18; to North America, to South America, fig. 5, 13; to specific countries, fig. 6, 14; MATERIALS, proportion of total exports, fig. 4, 10; to Europe, fig. 5, 13; proportion of exports to Europe, 12; to North America, fig. 5, 13; oats, wheat, proportion of world's exports, 8.
    Countries: to major continental divisions, fig. 5, 13; to Great Britain, proportion of exports to Europe, of total exports, 26; total, and manufactures, to specific countries: Argentina, Australasia, Belgium, Brazil, Canada, Chile, China, Cuba, Dutch East Indies, France, Germany, Great Britain, India, Italy, Japan, Mexico, Netherlands, Philippines, Spain, Straits Settlements, fig. 6, 14.
  Imports:
    Commodities: composition, fig. 4, 10; major, fig. 8, 22.
    Boards, value, fig. 8, 22.
    Calfskins (pieces), fig. 19, 128, from Argentina, Canada, France, India, fig. 19, 128.
    Cattle hides (pounds), 1900 to 1920, 129; (pieces), fig. 19, 128, from Argentina, Canada, India, fig.

UNITED STATES (*continued*)
  19, 128; value, fig. 8, 22.
  Cocoa, quantity, 151, 1873 to 1921, fig. 25, 152; annual average, 1919–21, fig. 26, 153, from Brazil, Ecuador, Gold Coast, Trinidad and Tobago, Santo Domingo, fig. 26, 153.
  Coconut oil, 353, proportion from Dutch East Indies and Philippines, 354.
  Coconut products, value, 348, fig. 8, 22; from Malaysia, 348.
  Coffee, quantity, 137, 1870 to 1920, fig. 23, 141; annual average 1919–21, fig. 21, 136, from Brazil, Colombia, Dutch East Indies, Guatemala, Haiti, Mexico, Venezuela, fig. 21, 136; value, 137, 348, fig. 8, 22; proportion from Brazil, 137, from Central America, 244; from East Indies, 348, 356; proportion of imports of foodstuffs, 8.
  Copper, quantity, fig. 33, 188; from Chile, Japan, Mexico, fig. 33, 188; value, fig. 8, 22; proportion from Mexico, 270.
  Copra, quantity and value, 353, proportion from Dutch East Indies and Philippines, 354.
  Cotton, quantity, fig. 65, 361; from Egypt, fig. 65, 361; value, fig. 8, 22.
  Diamonds, value, fig. 8, 22.
  Flaxseed, quantity, 128, value, fig. 8, 22.
  Furs, value, fig. 8, 22.
  Goatskins, pounds, from India, 372; value, fig. 8, 22; proportion from India, 371.
  Hemp, value, 348; proportion from Malaysia, 348.
  Jute, quantity, 372; value, fig. 8, 22; proportion from India, 369.
  Linseed, *see* Flaxseed.
  Manufactures, proportion of total imports, 10, 12, fig. 4, 10; from Europe, proportion of total imports from Europe, of total imports of manufactures, 20.
  Materials, proportion of imports, 12, fig. 4, 10.
  Paper, value, fig. 8, 22.
  Petroleum, quantity, fig. 46, 263; from Mexico, fig. 46, 263; value, fig, 8, 22.
  Rabbit skins, proportion of imports from Australia, 381.
  Reëxports from Europe, proportion of total imports from Europe, 20, from Great Britain, fig. 9, 27; proportion of total imports from Great Britain, 20, 26.
  Rubber, quantity, 1900 to 1921, fig. 24, 143, fig. 61, 347, from Brazil, British East Indies, Dutch East Indies, Straits Settlements, fig. 61, 347; proportion from Brazil, 144; value, 348, fig. 8, 22; from Malaysia, 348.
  Sheepskins, pieces, fig. 73, 385; from Argentina, Australia, India, New Zea-

UNITED STATES (*continued*)
land, South Africa, United Kingdom, fig. **73**, 385.
Shellac, quantity, 372.
Silk, quantity, 300, 1870 to 1920, fig. **55**, 301, fig. **54**, 299, from China, Japan, fig. **54**, 299; value, 300, fig. **8**, 22, proportion of silk imports from Japan, 298.
Sugar, quantity, fig. **38**, 221, from Cuba, Dutch East Indies, Philippines, fig. **38**, 221, value, 348, fig. **8**, 22, proportion, of total imports, 221, from Cuba, proportion, 221, from Malaysia, 348.
Tin, quantity, fig. **63**, 351, from Bolivia, China, Dutch East Indies, Malaya, fig. **63**, 351; value, 348, fig. **8**, 22; from Malaysia, 348.
Tobacco, 348, fig. **8**, 22; from Malaysia, 348.
Wheat and wheat flour, value, fig. **8**, 22.
Woodpulp, value, fig. **8**, 22.
Wool (pounds), 1900 to 1921, 130, value, fig. **8**, 22; proportion from Argentina and Uruguay, 130, from Australia and New Zealand, 130; proportion from Argentina, Australia, British South Africa, Chile, Uruguay, 390.
Countries: major, fig. **6**, 14.
Argentina, fig. **6**, 14, major commodities, 131; calfskins, cattle hides (pieces), fig. **19**, 128; sheepskins (pieces), fig. **73**, 385; wool, 130, proportion from, 390.
Australasia, fig. **6**, 14; wool, proportion from, 130; 390.
Australia, sheepskins (pieces), fig. **73**, 385; wool, proportion from, 390.
Belgium, fig. **6**, 14.
Bolivia, tin, fig. **63**, 351.
Brazil, fig. **6**, 14; calfskins, fig. **19**, 128; cocoa, 151, fig. **26**, 153; coffee, 137, fig. **21**, 136; rubber, fig. **61**, 347, proportion from, 144.
British East Indies, rubber, fig. **61**, 347.
Canada, fig. **6**, 14; calfskins, fig. **19**, 128; cattle hides, fig. **19**, 128.
Central America, coffee, proportion from, 244.
Chile, fig. **6**, 14; copper, fig. **33**, 188; wool, proportion, 390.
China, fig. **6**, 14; silk, fig. **54**, 299; tin, fig. **63**, 351.
Colombia, coffee, fig. **21**, 136.
Cuba, fig. **6**, 14, sugar, fig. **38**, 221, proportion from, 221.
Dutch East Indies, fig. **6**, 14; coconut oil, proportion, 354; coffee, fig. **21**, 136; copra, proportion from, 354; rubber, fig. **61**, 347; sugar, fig. **38**, 221; tin, fig. **63**, 351.
Ecuador, cocoa, fig. **26**, 153.
Egypt, cotton, fig. **65**, 361.
France, fig. **6**, 14; calfskins, fig. **19**, 128.
Germany, fig. **6**, 14.
Gold Coast, cocoa, fig. **26**, 153.

UNITED STATES (*continued*)
  Great Britain, fig. **6**, 14, proportion of imports from Europe, of total imports, 26; sheepskins, fig. **73**, 385.
  Guatemala, coffee, fig. **21**, 136.
  Haiti, coffee, fig. **21**, 136.
  India, fig. **6**, 14; calfskins, fig. **19**, 128; cattle hides, fig. **19**, 128; goatskins, proportion, 371; jute, proportion from, 370; sheepskins, fig. **73**, 385.
  Italy, fig. **6**, 14.
  Japan, fig. **6**, 14; silk, fig. **54**, 299, proportion from, 335.
  Malaya, tin, fig. **63**, 351.
  Malaysia (East Indies), major imports, 348; coconut products, 348; coffee, 348, proportion from, 356; hemp, 348; rubber, 348; sugar, 348; tin, 348; tobacco, 348.
  Mexico, fig. **6**, 14; major imports from, 262; coffee, fig. **21**, 136; copper, fig. **33**, 188; petroleum, fig. **46**, 263.
  Netherlands, fig. **6**, 14.
  New Zealand, sheepskins, fig. **73**, 385.
  Philippines, fig. **6**, 14; coconut oil, proportion, 354; copra, proportion from, 354; sugar, fig. **38**, 221.
  Santo Domingo, cocoa, fig. **26**, 153.
  South Africa, sheepskins, fig. **73**, 385; wool, proportion from, 390.
  Spain, fig. **6**, 14.
  Straits Settlements, fig. **6**, 14; rubber, fig. **61**, 347.
  Trinidad and Tobago, cocoa, fig. **26**, 153.
  United Kingdom, *see* Great Britain.
  Uruguay, wool, proportion from, 390.
  Venezuela, coffee, fig. **21**, 136.
Industry: a national objective, 9.
  Competitive advantages in production, 60.
  Cotton textiles, compared with British in use of machinery, of power, in productive efficiency of worker, 48, and value of output, 50; growth, since 1880, 50.
  Power used per hundred workers, 211, compared with British industries, 59.
  Workers, proportion females, 317.
Interest, in Argentina, 124 f.; in Australia, 378; Brazil, 183; Central America, 242; Chile, 214; China, 306 f.; Cuba, 230 f.; Dutch East Indies, 357; Europe, 16 f., 21; extra-European countries, 21; France, 93; Germany, 70; Great Britain, 27; India, 377; Japan, 335; Malaysia, 344; Mexico, 262 f.; Middle America, 215; New Zealand, 392; Philippines, 339.
Interests, Caribbean, 218, 256.
Intervention, in Central America, 253 f.; China, 310, 324 f.; Cuba, 219; Haiti, 235; Santo Domingo, 235.
Iron reserves, 57.
Livestock: cattle, number of head, fig. **19**, 128, compare Argentina, 125; proportion of world's stock, 43; sheep, number of head, fig. **73**, 385; relative standing, 125.

UNITED STATES (*continued*)
  Merchant marine, 314.
  Naval bases in the Pacific, 336.
  Petroleum, importance for trade and shipping, 265, 357; importance of Mexican, 266; of oil bunkering stations in Caribbean, 266.
  Policy toward private enterprise abroad, 254; toward Central America, 253 f.; toward China, 325; toward the Philippines, 341.
  Population, density, 216; growth, 18, fig. 2, 7; proportion engaged in agriculture, 94, industry, 387; proportion, rural dwellers, 94; rate of increase, 168.
  Ports, number relative to area, 36.
  Price of coal, compared with French and German Westphalian, 97, compared with Japanese, 317.
  Production:
    Agricultural products, value, 387.
    Artificial silk, 305.
    Coal, 67, 1871 to 1921, fig. 13, 98; proportion of world's output, 67; relative standing, 44.
    Copper, fig. 33, 188; 1918 to 1921, 203; 1879 to 1891, 202; proportion of world's output, 194; relative standing, 44.
    Corn, 362; proportion of world's production, 125.
    Cotton, 295, 362, fig. 65, 361.
    Cotton textiles, value, 315; compared with British, French, Italian output, 50.
    Grain, 127.
    Iron (pig), 1870 to 1921, fig. 11, 58; per blast furnace, per worker, 112; relative standing, 44.
    Lead, relative standing, 44.
    Linseed, proportion of world's production, 125.
    Manufactures, value of, 387.
    Petroleum, fig. 46, 263; proportion of world's output, 65, 263; relative standing, 44.
    Silk, artificial, 305.
    Silk textiles, value, 316.
    Silver, 268.
    Sugar, beet, 223.
    Wheat, 362; proportion of world's production, 124; relative standing, 124; yield per acre, 315.
    Zinc, relative standing, 44.
  Purchase of Philippines, 339.
  Reciprocity agreement with Cuba, 223.
  Reserves: coal, 63; copper, proportion of total world's estimated resources, 187; iron, compared with Great Britain, 57; petroleum, depletion of, 264; tin, 350.
  Responsibility toward China, 335.
  Sheep, number of head, 362, fig. 73, 385, relative standing, 125.
  Strategic importance of Philippines, 341.
  Trade, *see* also Exports and Imports.
    Composition, fig. 4, 10.
    "Indirect" trade, injury to exports of manufactures, 20, 346, 390.
    Major commodities imported, fig. 8, 22.
    Major countries, fig. 6, 14.
  War:
    Disadvantages of United

UNITED STATES (*continued*)
        States in war with Japan, 335.
      Effect of the World War upon United States trade, 21.
    Waterpower, actual, 67; potential, 173; in New Hampshire, New York, Niagara Falls, 62.
    West Indian possessions, 216.
Urban population, density, in Germany, 5; growth, 41, in United States, fig. 1, 6; proportion of total population in Argentina, 120, in Australia, 335, in Germany, 92.
Uruguay, number of cattle, relative to population, to area, 203; proportion of United States wool imports from, 390.
Uses: of coal, proportion for domestic, for industry in Great Britain, 62; coconut products, 352; copper, 194; goatskins, 371; gold, monetary qualities, 268; hemp, manila, 355; iron, 56; jute, 370; nitrates, 186, 200; petroleum, 264; rubber, 144; shellac, 371; silver, 268; tin, 349.

Valenciennes (vȧ′län syĕn′), coal field, 97.
Valparaiso (văl pā rā′zō), death rate in, 197; proportion of Chile's import trade handled through, 198.
Vega Real (vā′gä rā äl′) of Santo Domingo, area, fertility, 238.
Vegetable fats and oils, increasing consumption, 353; production in United States, compared with animal fats, 353.
Vegetarianism in China, 284.
Venezuela, coffee production, United States imports from, fig. 21, 136.
Versailles, Treaty of (vĕr sä′y′, or vĕr sālz′), 83, effect upon increasability of factors of production of Germany, 88; coal deliveries under, 109.
Virgin Islands, purchased by United States, 256.
Vladivostok (vlä′dyĕ väs tôk′), 329.

War:
  Disadvantages of United States in war with Japan, 335.
  Early effects of World War upon Chile's nitrate industry, 199.
  Effect of World War upon United States trade, 21.
  Japan's design in entering, 330.
Washington Conference, 333.
Waste of fertilizer content of sewage in United States, 283.
Wasteful methods of sugar cultivation in Porto Rico, 241.
Water, amount required by crops per ton of product, 283.
Waterpower, equivalent in terms of coal, 318.
Waterpower, of Brazil, 173, 174; of Chile, potential, 208; of Europe, 67; of France, 110; of Great Britain, 62, 110; Italy, 110; Japan, 318, Santo Domingo, 239; Spain, Sweden, Switzerland, 110; United States, 67, 173; in New Hampshire, New York State, 62, Niagara Falls, 62, 173; equivalent in terms of coal, 67, 318.
Watt, James, constructed first practicable steam engine, 30.
Weihaiwei (wā′hī wā), strategic importance, 329.
West Indian dependencies, area of, 216.

West Indian possessions of United States, 216.
West Indies, population density, 216, trade, 218, per capita, 218.
Western civilization in India, effects, 373.
Western encroachments upon China, 325.
Western interests, an obstacle in the way of Japan, 324.
Westphalian coal: price, 97; production, 105, in 1870, 111; quality, 106; reserves, 78, 105, of coking coal, 106.
Wheat:
  Acreage in Australia, 388.
  Consumption per capita, in India, in United States, 363.
  Exports from Argentina, 118; United States, proportion of world's exports, 8.
  Food value, yield per acre, 246, relative, 127.
  Production: of Argentina, relative standing, 118; Australia, 388; Belgium, relative to population, 86; British Empire, proportion of world's output, 43; Germany, per acre, 79, relative to population, 86; Great Britain, per acre, 315, relative to population, 86; India, 362, relative standing, 361; Japan, per acre, 315; Russia, 362; Switzerland, relative to population, 86; United States, 362, per acre, 315, proportion of world's production, 124.
Wheat and wheat flour: exports from China, proportion of total exports, 298; United States imports, value, fig. 8, 22.
Wheat flour, exports from India, 363.
Wheat-growing regions of Brazil, 162.
White population, proportion in Dutch East Indies, in Philippines, in Straits Settlements, 346.
Wood, resources in Brazil, 158.
Woodpulp, United States imports, value, fig. 8, 22.
Wool:
  Exports, proportion of total exports to United States from Argentina, 132, from Australia, 390, from New Zealand, 392.
  Imports, of Great Britain, proportion from Australia, 55; of United States, value, fig. 8, 22; proportion from Argentina, Australasia, British South Africa, Chile, Uruguay, 390.
  Production of Australia, 388.
  Requirements of United States, 390.
Wool textile industry:
  Alsace, number of spindles, 103.
  France, 99, 100, 103.
  Germany, 82.
  Great Britain: exports compared with cotton textiles; importance of industry compared with cotton textile manufacture; proportion of total exports; reversion from capitalistic production: increase in exports of woolens, decrease in worsteds, 52 f.
  Japan, value of output, 316.
Woolens: defined and contrasted with worsteds, 53, declining production; increasing exports from Great Britain, 53.
World exports, proportion supplied by United States, of corn, cotton, oats, wheat, 8.
World production: cocoa, fig. 26,

153; coffee, fig. 21, 137; copper, fig. 33, 188; cotton, fig. 65, 361; petroleum, fig. 46, 263; rubber, 1900 to 1921, fig. 24, 143, annual average 1919–21, fig. 61, 347; silk, fig. 55, 301; sugar, cane, fig. 38, 221; tin, fig. 63, 351.
World War:
  Early effects upon Chile's nitrate industry, 199.
  Effect upon United States trade, 21.
  Japan's strategy in entering, 330.
World's major cattle-raising countries, fig. 19, 128; sheep-raising countries, fig. 73, 385.
Worsteds (*see* Woolens), 53.
Wyatt, James, invented machine for spinning, 29.

Yangtse (yäng'tsĭ') River, 287.
Yangtse River basin, description, provinces of, 290 f.
"Yellow Peril," 338.
Yellow River (Hoang-ho), 287; floods, 288.
Yellow River basin, description, provinces of, 288.
Yerba maté, properties, regions where grown, 156 f.
Yezo, or Hokkaido, area, 312.
Yield:
  Barley, per acre, in Germany, 79: Great Britain, 315; Japan, 315; increase by use of fertilizer, 79, 186.
  Coconuts, per tree, 354.
  Copra, per acre, 354.
  Jute fiber, per acre, 370.
  Oats, per acre, in Germany, 79; increase by use of fertilizer, 79.
  Potatoes, per acre in Germany, 79; increase by use of fertilizer, 79.
  Rice, per acre, compare corn and wheat, 285; Chengtu Plateau, 292; in Hawaii, India, Italy, Japan, 315.
  Rubber latex per tree, 149.
  Rye, per acre, in Germany, 79; increase by use of fertilizer, 79.
  Sugar, per acre in Cuba, in Porto Rico, 241.
  Sugar cane per acre in Cuba, 237, 241, 356; Java, 356; Porto Rico, 241; Santo Domingo, 237.
  Wheat, per acre, in Germany, 79, Great Britain, Japan, United States, 315; increase by use, of fertilizer, 79, 186.
Yield of food value per acre, of bananas, potatoes, wheat, 246.
Yokohama, distance to Calcutta, 45; to Hawaii, Philippines, San Francisco, 341; to Sydney, 45.
Young, Arthur, improved methods of agriculture, 33.
Yucatan, sisal-growing state in Mexico, 270.
Yunnan (yûn'nän'), Province of, description, resources, 293.

Zinc, British commercial and political control over production, extent of, 44; relative standing of United States, 44.
Zollverein, 71.

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